The

Geographical Journal.

No. 4. APRIL, 1896. Vol. VII.

PROPOSED GEOGRAPHICAL DESCRIPTION OF THE BRITISH ISLANDS BASED ON THE ORDNANCE SURVEY.*

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Geography, in its etymological sense, the description of the Earth, only begins where exploration ends. Thus, although exploration is necessarily the chief work of geographers at the outset, the exhaustion of unknown territory, remote as that achievement may be, will not require geographical societies to close their doors and declare their work accomplished. The facts as to the Earth's surface cannot be described before they are discovered; and they cannot be described fully until they have been studied, compared, and grouped in the way best adapted to bring out their mutual relationships. There is, I believe, practical unanimity amongst geographers of the present day in viewing geography as a science of definite individuality, though of wide generalization, dealing with the material collected by all specialists who explore or investigate the distribution of phenomena on the surface of the Earth.

This I expressed as follows in an article on "Geography as a Science in England," which appeared in *Knowledge* for January, 1896:—

"Geography as a science is not respected because it is not understood; and the ground of the misunderstanding, in some cases at least, is that 'a science' is not uncommonly looked upon as a department of specialized knowledge. Starting with this idea, it is perfectly logical for an objector to say that the ground claimed for geography is covered by the sciences of astronomy, geodesy, geology, oceanography, meteorology, botany, zoology, history, and anthropology—if, as is not likely, he allows that the last-named are sciences—and to declare that there is no room for the 'science of geography.' I contend that the departments of natural knowledge cannot be so 'clean cut from out and off the illimitable'

* Paper read at the Royal Geographical Society, March 6, 1896.

as to admit of their being arranged side by side to cover the field of nature like a tesselated pavement. Each one is, to a greater or less extent, permeated by those surrounding, and permeates them in turn: the astronomer is not independent of the chemist, nor the meteorologist of the astronomer. If sciences are to be viewed as *tessellæ*, the 'sciences' as at present familiarly classified must be analyzed into units of profound specialism, each of which may be a single and independent study, and may be utilized, differently combined, in neighbouring 'sciences.'

"We may, then, view 'a science' as composed of a group of specializations, a molecule compounded of atoms, so that the same atoms of ultimate specialization may be combined successively in different molecular generalizations. Another step carries us to the recognition of sciences of higher generalization, in which the units are the 'molecular' sciences themselves, combined and subordinated to a new yet special purpose. It is easy enough to recognize physics as capable of analysis into mathematics and the sciences of matter and energy—heat, light, electricity, and so on; yet he would be accounted a student of little perception who should deny the claim of physics to be a science because the ground is already covered with heat, light, and the rest. It is only in unfamiliar paths that scientific men 'cannot see the wood for trees.'

"My claim is that geography as a science is so far akin to physics that it is a generalization of the second order, a natural grouping of compound units which are individually distinct. The physicist looks on nature in the universal aspects of matter and energy; the geographer looks on nature in the limited, but still general, aspect of the surface of the Earth.

"Geography as a science is the exact and organized knowledge of the distribution of phenomena on the surface of the Earth. This involves the human race; and because the human race represents the culmination of organic evolution, the true understanding of the interaction of man with his terrestrial environment is the final object of geography. The materials for building up the final generalizing science fit to fulfil such an aim are yet far from complete; but they are already outlined with sufficient clearness to allow of progress being made in the general study. Incompleteness of data is the best incentive to progress and the surest guarantee of substantial advance. . . .

"I have already on several occasions endeavoured to give expression to my views of the content of geography as a science,* and need only quote here the opinion that the ultimate aim of geography is 'the elucidation of the Earth viewed as the present expression of a

* See 'The Realm of Nature' (London: John Murray); also "The Principles of Geography," in the *Scottish Geographical Magazine* for February, 1892; and "The Geographical Work of the Future," in the same journal for February, 1895.

definite evolution, in which every part is subordinated to the production of a suitable home and sphere of influence for civilized man.' The way to attain this end is obviously to proceed toward the completion of our knowledge of all the phenomena the interaction of which is in question, aided by such principles and relationships as can be deduced from what is already known.

"The astronomer, geologist, oceanographer, meteorologist, botanist, zoologist, anthropologist, and historian are all laid under contribution in different and varying degree to supply the building material for the geographer to combine, according to his special view-point, into a generalized science, capable of endless application to the sciences which helped to form it, and to the affairs of daily life. A large part may be taken in advancing a science without the individual specialists realizing the full import of their contributions, and comparatively few great travellers and explorers have been consciously geographers. In considering the position of scientific geography, it is desirable to distinguish between detailed exploration and research recorded for convenience by various adaptations of cartographic art, and the discussion and co-ordination of the relations which exist amongst the various special elements; to distinguish, in fact, between the collection and the interpretation of facts."

The attention of geographers has hitherto been directed mainly towards the collection of facts; we now require to discuss and arrange them. More facts and more surveys are, of course, required to perfect our knowledge; but for many parts of the world the main outlines are ready for discussion. The principles of geography serve as a trustworthy guide for describing a district which has been fully explored, and of which exact hypsometrical, geological, and other maps, have been prepared. The introductory plates in Mr. Bartholomew's new *Atlas of Scotland* contain a striking set of maps, on which a complete geographical description of that country might be based; but as the scale of the maps is small, the corresponding description would require to be general rather than detailed. The maps in question show the general configuration, the river-basins, the distribution of vegetation or agriculture, the distribution of population as to density and as to language, the rainfall and the temperature for each month of the year, the geological structure, the distribution of indigenous animals, the limits of deer-forests and fishery districts, and, finally, the counties. A geographical description of these maps as a whole would set forth the fundamental condition of vertical relief as influenced by geological structure on the one side, and as influencing climate, soil, vegetation, and the human inhabitants on the other, explaining how the people are related to the land.

With regard to the British Islands as a whole, the only maps in existence on an adequate scale are those of the Ordnance, Geological,

and (for the coasts) Hydrographic surveys. It is probably too much to hope that these will soon be supplemented by agronomic maps such as are now being prepared in France, and also, I understand, in some parts of Germany; and it is, unfortunately, scarcely possible that the other conditions dealt with by Mr. Bartholomew will ever be fully mapped for the country as a whole.

The question of a geographical description of the British Islands has been before my mind for several years, and many ideas have suggested themselves as to the form such a work should take. There are a few fragments sufficiently large and sufficiently good to make a geographer regret that they are of restricted scope, and written usually from an aspect that is incompletely geographical. Sir A. Geikie's 'Scenery of Scotland,' Sir A. Ramsay's 'Physical Geology and Geography of the British Islands,' and Mr. Topley's 'Memoir on the Weald,' are a few out of many works which have been prepared from the geological point of view. There are many guide-books excellent for their purpose, the information in which, if rearranged in systematic form, would be geographically valuable; and there are a few good books on special districts, such as those prepared for British Association meetings, giving in some cases a really comprehensive account of the different natural conditions by independent specialists. As a rule, these works are not knit together by the unifying influence of geographical principles. In Germany the valuable monographs on (to select titles at random) the deciduous forests of Saxony, the distribution of German-speakers in the French part of Switzerland, the orography of the Eifel, the rainfall of Silesia, etc., which appear in the 'Forschungen zur Deutschen Lands- und Volkskunde,' are excellent examples of work individually good, but incapable of being combined, and never likely to cover the whole country with a uniform degree of elaboration. Regional geography has received a good deal of attention in other countries, and several districts have been made the objects of excellent memoirs, such as Auerbach's on the Lorraine Plateau. Something of a similar kind, specially adapted to our own country, and considering the whole of it in equal detail, is, I think, what is required. So many large schemes are spoilt by want of uniformity in their execution, or by incompleteness on account of attempting too much at the outset, that it is essential in any new plan to consider the possibilities of the work very carefully before commencing.

I propose, then, to discuss whether a complete geographical description of the British Islands could be prepared from existing data, or how far these should first be supplemented by new researches and by the collection of unpublished information. The work would have to be done on a uniform scale for every small selected unit of the country; then combined into a series of regional memoirs dealing with natural districts, such as the Weald, the Cornwall-Devon peninsula, Wales, the Lake District, the Pennine chain, East Yorkshire, the Scottish Southern

Uplands, Central Plain, Highlands, etc. Ultimately all these would require to be generalized into one great memoir on the whole country, the result of a series of generalizations carried out much in the same way as the various maps of the Ordnance Survey are obtained by successive generalizations from the largest scale produced. Counties or even parishes might be selected as units for description, but there are serious difficulties in doing so. The size of these divisions is so varied, and their outlines are so fantastic in detail, that a great deal of overlapping would be unavoidable; and, besides, for the physical description on which the whole must be based the county boundaries are quite unsuited. The 6-inch maps into which the counties are divided are on too large a scale to be taken as the basis of a general discussion, which must be kept within practicable limits. The 1-inch map might more appropriately be adopted as the basis of the description, which might, in the first place, be made a "Geographical Memoir to the Ordnance Survey Map on the scale of 1 inch to 1 mile." The map is, of course, divided up into sheets without regard to physical or political features; but the sheets have the advantage of being rectangular, of uniform size,* and of existing as actual units, each one of which may be separately purchased, and any of them readily found by reference to an index map which gives its number. A group of adjacent sheets might be treated together in a single memoir, if that method is found to be preferable.

The idea of a memoir to the Ordnance Survey is so essential to the completeness of the work, that it was naturally accepted long ago. The first volume of a memoir on Ireland was actually published in 1835, and a great amount of most interesting information collected, when, by one of the unfortunate changes of policy which have harassed the survey, the work was stopped. On the assumption that a new memoir might be prepared, I shall consider in order the chief sources of information, the plan of the memoir, the method of executing the work, and its probable magnitude, duration, and utility.

1. Chief Sources of Information.

(*a*) The basis of the description should be the topographical map of the Ordnance Survey on the scale of 1 : 63,360 or 1 inch to 1 mile. This, including the new survey of England, will be complete before the close of the present century. The sheets, measuring 18 inches by 12, contain 216 square miles of surface for England and Ireland; but the sheets for Scotland measure 24 inches by 18, and contain 432 square miles. The map is in two editions, showing relief by hachuring and contouring respectively, and all sheets are graduated on the edge to single minutes of latitude and longitude, with subdivisions to 10 seconds. In special

* The sheets of the map of Scotland are twice as large as those of England or Ireland.

cases the maps on the scale of 1 : 10,560 or 6 inches to 1 mile would be referred to.

(*b*) The maps of the Geological Survey on the same scales supply in many cases the geological reasons for geographical conditions, and the memoirs to the various sheets or on selected districts usually give valuable summaries of the physical geography from the geological standpoint.

(*c*) The charts of the Hydrographic Department supply full details as to sea-depths along the coast, and as to depths of navigable rivers and a few lakes.

(*d*) The publications of the Meteorological Office, of the two Meteorological Societies, and of Mr. Symons (for rainfall), contain a great amount of information as to the climate of the British Isles.

(*e*) The Census Reports give full particulars of the population of each registration district and of their occupations, a matter of great geographical importance, although I am not aware that the distributional relations of the Census have ever been fully worked out in the manner adopted, for example, by the United States Census Office.

(*f*) The Reports of Births, Marriages, and Deaths supplement the Census Returns in many ways, and contain materials for statistical maps, including maps of the distribution of diseases as worked out by Dr. Haviland for the Lake District.

(*g*) The Board of Trade and other Government departments publish full accounts of exports, imports, and of internal transport, of mineral and agricultural produce and manufactures, all of which are capable of geographical treatment.

(*h*) The publications of such societies as the Royal Agricultural, the Archæological, the Statistical, the Institution of Civil Engineers, and many others, contain papers on subjects which may be profitably consulted, and there are numerous county histories and books on special aspects of geography from which help may be obtained.

(*i*) There are now several amateur photographic societies which make systematic collections of characteristic pictures of their own neighbourhood, such as that over which Sir Benjamin Stone presides in Warwickshire. Numerous local scientific societies are rendered accessible and capable of acting in concert through a committee of the British Association, many of the members of which are willing to act as skilled collectors of information. I have, in a previous research, had occasion to ask the co-operation of these societies, with the happiest result.

2. Plan of the Memoir.

Taking the 1-inch map as a basis, the discussion and treatment would be on a corresponding scale. No doubt, by enlarging on each of the heads to be mentioned, a treatise of great length might easily be compiled for each sheet. My proposal is to aim at conciseness; as far as possible to touch only on essential matters, and to treat these

exclusively from the geographical standpoint. A good deal of repetition would be avoided by the preparation of an introductory memoir describing the general features of ordnance maps, explaining scales, the use of contour-lines, and map-reading generally. This should also contain a statement of the principles of geography as applied to regional descriptions. The suggested memoir for each sheet would include—

(*a*) *Index* of all names on the sheet, referring to them by latitude and longitude in areas of one minute by one minute, giving also the altitude (exact or approximate) in the case of hills, river sources, towns, villages, houses, etc., and the length of streams or portions of streams included.

(*b*) *Place-names.*—Notes on such of the place-names as present features of geographical interest.

(*c*) *Mean elevation* of the sheet, with the areas between successive contour-lines, and statement of maximum and minimum heights.

(*d*) *Hypsographical Description.*—A general statement of the elevations and depressions of the sheet, mentioning their relation to the larger features of the country. Length of streams and their drainage areas.

(*e*) *Physiographical Explanation* with reference to the type of land-form in relation to geological structure, the position of the surface in the cycle of geographical development, the character of the soils and mineral productions, the local magnetic conditions, and the conditions of climate, so far as these are dependent on position and configuration.

(*f*) *Vegetation and Agricultural.*—The approximate areas of woodland, moorland, pasture, arable land, and the leading crops. Local floras and faunas.

(*g*) *Political and Historical.*—The parish, county, and municipal boundaries. Historical sites, and events which depended on geographical conditions.

(*h*) *Geographical Description*, showing the relation of the human inhabitants to all the foregoing conditions, especially with regard to the sites of towns and villages, the distribution of population, the utilization of natural resources, and historical development of industries. Local vocabularies.

(*i*) *Illustrations.*—A few carefully selected photographs of typical scenery should accompany each sheet. Some sketch-maps and diagrams might also be included.

(*k*) *Bibliography*, giving titles of works relating to places contained in the sheet.

Several matters of very great importance cannot be included, because the facts to be ascertained would involve special surveys, *e.g.* the variation of the force of gravity; the seismic conditions; hydrographic conditions involving the volume, speed, and normal seasonal fluctuations of all rivers—a subject which will acquire great economic importance in a few years—and the ethnopological description of the people.

3. Method of Execution.

Assuming that a geographical description on the plan indicated were to be carried out under proper conditions, the various points mentioned might be worked up as follows:—

(*a*) *Index.*—This requires simple mechanical compilation. It would vary greatly in length, some sheets having less than 50 names, others probably more than 1000. (Official indexes to the maps of the United States Survey are published as part of the routine of that Survey Office.)

(*b*) *Place-names.*—The notes would be limited to (1) alternative names for places mentioned in the sheet, (2) corrections of spelling, (3) critical discussion of such place-names as are descriptive of geographical forms or positions, (4) discussion of names which can be traced by historical records sufficiently far back to throw light on prehistoric populations. The necessary information would be obtained from topographical and archæological works, from dictionaries of place-names, and from local students; but the lists would require very careful editing by an expert, and must be strictly limited to cases concerning which there is no reasonable doubt.

(*c*) *Mean Elevation.*—The area between successive contour-lines on the map must be measured by the planimeter or by squared tracing-paper, and the volume deduced by considering the mean inclination of the successive surfaces, which would also give the true area of the country as contrasted with the area projected on the plane of sea-level given on the map. The distortion due to the conical projection on which the map is drawn will probably be too insignificant to require notice; if not, it must be allowed for. Check estimates might be made by Heiderich's method of drawing numerous equidistant profiles, and calculating the contents by Simpson's formula; and also by marking as many actual elevations as possible on the map, and combining the arithmetical averages of each square inch, as in Karsten's method of estimating ocean depths. This work demands a considerable amount of skill and attention. It would be very suitable as an exercise and training for students, if any institution existed in this country where students could be induced to study geography seriously.

(*d*) *The Hypsographical Description* would in most cases be very brief. It should be written from the map, considering both hachures and contour-lines, and afterwards verified on the ground. The lengths of parts of rivers and their drainage areas would be treated in this description.

(*e*) *The Physiographical Explanation* would, so far as the geology is concerned, be simply a restatement of the "Physical Geography" section of the Geological Survey memoir, with such modifications as the modern views of the cycle of development of a land surface suggest. The character of the soils would, to a certain extent, be derived from the drift-maps of the Geological Survey, from notes of official or private geologists, and in some cases from local inquiries. The mineral

productions would be described from the official returns. Climatic data would be derived from the publications of the Meteorological Office and of societies, supplemented in many cases by local information.

(*f*) *Vegetation and Agriculture.*—The areas of forests, parks, and moorland or commons would be measured on the 6-inch Ordnance Survey maps, on which a distinction between different kinds of wood is made. The agricultural information would be got from official returns, the transactions of agricultural societies, and local inquiries; while a knowledge of any peculiarities of local flora and fauna would be similarly obtained.

(*g*) *Political and Historical.*—The boundaries would be taken as shown on the map, referring to any important changes, such as the Reports of Boundary Commissioners. Historical information would be sought from historical and archæological societies, and would be very stringently edited, so as to confine it strictly to those features and events of direct geographical importance.

(*h*) *The Geographical Description* would be the most important part of the memoir, and must be the work of a trained geographer, who, after studying the maps in the light of all the information referred to above, shall have made himself familiar with the ground. It would deal directly with the relation of the people to the land, showing the control exerted by geographical conditions on the sites of towns, on dwellings, occupations, the distribution of the people, the lines of communication, and, if data are forthcoming, on local character. Historical changes in the resources and industries of a region would be considered, to show in what degree they occurred in consequence of geographical changes, *e.g.* the silting up of harbours, the destruction of forests, the discovery or exhaustion of minerals; or in what degree they occurred in spite of geographical conditions, *e.g.* the establishment of a gunpowder factory in an agricultural district, or the tunnelling of a hill by a new railway. Many of the more interesting relations to be discussed in this description are undergoing change, and unless they are soon studied and recorded the value of the work will be much reduced.

(*i*) *Illustrations.*—A sketch-map on the scale of, say, 10 miles to the inch would be given, showing the area of nine sheets of the 1-inch map, including the eight sheets which touch the sheet under consideration. A small index map on the outside cover could show the sheets contained in the whole country (England, Scotland, or Ireland, as the case might be). One or two characteristic profiles on a natural scale might be given; and a selection of views of characteristic scenery taken from a carefully chosen standpoint. It might be found possible in a few cases to give characteristic type-portraits of the people, and illustrations of the leading industries of the district.

(*k*) *Bibliography.*—All the books, articles, or references dealing with places referred to in the sheet would be recorded, so that a student could at once refer to all available original sources.

4. Probable Magnitude, Duration, and Utility of the Suggested Work.

The land area of the British Islands, excluding the Channel Isles, is estimated at 120,904 square miles, which would correspond to 560 sheets containing 216 square miles each, the size of the English 1-inch sheets. On account of the irregularities of coast-line, the 1-inch map of England contains 360 sheets, that of Ireland 205 sheets, and that of Scotland 131 sheets of double size, corresponding to 262. The total number is thus equivalent to 827 sheets of the usual size (18 inches by 12), but of these 27 at least are, so far as one can judge from the index maps, entirely blank, leaving 800 which would have to be considered. Of the 800 there are at least 258 which contain less than half their area of land surface. However, it seems to me that the advantages of having the memoirs in the form of a pamphlet corresponding to each sheet, and numbered in the same way, would be sufficient to make it worth while to face the prospect of 800 separate booklets. There might, in fact, be rather more, as the special sheets combined out of several to show the environs of important towns would naturally be included. The little books would be partly statistical and partly descriptive, and their aim would be to present the information in the concisest and most systematic form. In many cases several headings would scarcely be mentioned, *e.g.* in a sheet of Irish bog or Scottish deer-forest, the description would of necessity be very brief; and in the case of sheet 354 of the English map, the index would contain only one name, "Eddystone Lighthouse." In this instance, of course, a memoir would not be proposed, and possibly wherever a sheet contained less than a certain area, say 50 square miles, of land, it would be found convenient to reckon it as part of its next neighbour. If the memoirs were printed in royal octavo form, uniform with the *Geographical Journal*, the size of each might vary from 8 to 32, or possibly in rare cases to 48 pages. This is little more than a guess, but it illustrates the scale on which I think the work should be undertaken. The average length might be about 24 pages, which would give 19,200 pages for the whole work. This would correspond to twenty volumes of 960 pages, that is, of the size of the last volumes of the new series of the *Proceedings* of the Royal Geographical Society. If the work were undertaken with a sufficient staff to turn out an average number of forty memoirs in a year, it would require twenty years for its completion; an increased staff would allow of the work being more quickly completed. These figures are certainly somewhat formidable, but measured by the duration of the Ordnance Survey itself they shrink into insignificance, and compared with other large pieces of scientific literature, such as the 'Encyclopædia Britannica,' the 'Challenger Reports,' or Reclus' 'Geographie Universelle,' the time of preparation is not disproportionately long.

The utility of such a memoir may be reasonably doubted by the general public, but it must be clear to the mind of every geographer; and before twenty years go by we hope to have the education of the

general public also advanced to the point of appreciation. I feel confident that a memoir to each map would greatly enhance the usefulness of the maps themselves, and would help to make them more readily understood by those who now use them, and by the far too large number of people who have never heard of their existence. But I would not lay any stress on the argument of immediate utility. In my opinion the important practical point is that, in the prospect of increasing agricultural depression, and in prevision of the certainty of the ultimate recovery in the value of land in the British Islands when the fields of America, Russia, and India cease to yield a paying return at low prices, it is absolutely essential to have a trustworthy account of the actual conditions and resources of our own country. The account would in some degree correspond to Sir John Sinclair's 'Statistical Account of Scotland' of a century ago; but would, of course, have the advantage of a more systematic plan and far more numerous and more exact data. It will not be so very many decades before waterfalls will rival coal-mines in industrial value, and the tidal bore in an estuary will determine a centre of dense population. The study of the country in the light of scientific geography will then be a vital necessity, and it is our duty as geographers to see that we hand on our science as an efficient implement for the needs of a later age. A century ago the science of chemistry was in a state only a little less developed than geography is now, and the predictions of a Cavendish or Lavoisier as to the future utility of his science probably excited as little attention as the remarkable paper of General Annenkoff on the "Importance of Geography in view of Agricultural Crises" at the International Geographical Congress did last year.

I have little doubt that in the coming century the generalizations of geography will find a multiplicity of applications in economic, political, and social life, which will be of the utmost national importance. Even now we recognize instances, economic, political, and social, where ignorance or neglect of geographical principles has led to results which may fairly be called national misfortunes. I feel sure that some such scheme as that set forth in this paper will provide in its elaboration the means for greatly advancing geography and perfecting its theory; and on its completion will form a mass of geographical information which will retain a permanent value.

When the work is proceeding, regional memoirs embodying the data, but improving on the form, of the unit-descriptions would be compiled; and when it is complete, but not before then, the first real geography of the British Isles will become possible.

So far, I confess that the scheme is only a seductive dream. As in so many other great works in all sciences, the practical problem of expense presents a deterrent aspect. I have merely sketched in rough outline certain ideas which have gradually taken form in my mind, and I hope

that we may hear the opinions of experts upon them. If the plan is considered impracticable or inexpedient, I shall willingly let it rest until a fitter time. But if it is generally thought that the plan is a sound one, or is capable of such amendment as to make it satisfactory, a farther step must be taken, to consider whether Government could be urged to do the work, or whether the resources of scientific societies or the generosity of the not-impossible patriotic millionaire ought to be appealed to. The actual organization of the staff for carrying out the work may be left out of sight for the moment, but it should present no difficulty; there are very few professional geographers trained in modern scientific methods in this country, but, few as they are, they are to-day actually in excess of the demand for their services.

Before the reading of the paper, the PRESIDENT said: Dr. Mill is going to make a proposal to us, which, in my opinion, is of very great, almost imperial importance. I think, when he has read it, every one present will be of the same opinion, and it will probably lead to an interesting discussion. I will therefore not make any preliminary remarks, but will call upon Dr. Mill to address us on the proposed geographical description of the British Islands, based on the Ordnance Survey.

After the reading of the paper, the following discussion took place:—

Sir CHARLES WILSON (late Director-General of the Ordnance Survey): I think we are all much indebted to Dr. Mill for his extremely interesting and suggestive paper. Something of this kind was intended when the 6-inch survey was commenced in Ireland. It was intended to publish a complete memoir of every parish surveyed; but this was carried out for only a very small portion of the country. I think only two parishes were published, when the Treasury found the expense so great that they decided to stop the work. Besides the volumes published, a very large amount of information was collected with regard to Ireland, and this is now kept in manuscript in the library of the Royal Irish Academy. It has been utilized by various writers on Ireland, but never published in complete form. I think the programme which Dr. Mill has drawn out is an extremely good one, and covers nearly all the ground necessary. It is in one way rather inconvenient to select a sheet as the unit, because the physical features very often run out of the sheet; but I do not see how you could very well adopt any other unit. The plan of first of all utilizing single sheets for the collection of information, and then grouping the sheets so as to include the principal physical features, is a good one. The only question is that of expense, and it is certainly a difficult one. The cost of this work will be very large, and I am afraid, from previous experience, that there is not much chance of obtaining a grant from the Government. What I would suggest, if it could be done, as a practical means of commencing this work, is to select certain typical sheets (for instance, sheets containing the Hog's Back, or some portions of the country well known to people in London), and to work these out thoroughly and publish them. Then, if the public take to them, as I am quite certain they will do if the work is well done, I think there would be no difficulty in getting the money to complete all the memoir. If the work turns out to be popular, pressure could be put upon the Government, through the House of Commons, to assist by a grant in aid; but I am afraid there is no hope of getting Government assistance to give effect to an abstract proposal of this kind. I think that, if three or four sheets were selected, and memoirs published, after the manner of the geological memoirs, success would be almost certain.

Colonel J. FARQUHARSON (Director-General of the Ordnance Survey): I agree with Sir Charles Wilson that this very important proposal, from the point of view of the General Ordnance Survey, would be of very great advantage, if it could be carried out; and I am also of the same opinion as Sir Charles Wilson, that the Government would not, in the first instance, undertake to be responsible for the very considerable expense involved. Perhaps Dr. Mill would allow me to make one or two remarks about the proposals themselves. I am not quite sure that I agree with Sir Charles Wilson as to the area of sheets being selected; I am not at all sure that it might not, on consideration, be found that political divisions, like a county, or a certain number of parishes or hundreds, might not be advantageous. In the first place, it seems to me, with areas so small, you would have more overlapping in the case of sheets than of counties. Certainly, with 800 areas, you would have a great deal more repetition than if you took a larger area to work upon. Supposing you took the counties, you would have from 115 to 120 areas to which you would have to apply your descriptions; and the county or parish must always be taken into consideration in questions of this kind. For instance, in the Statistical Account of Scotland, the parish was taken; and another point in that account is, that the memoirs are written by local people, very often the minister, and occasionally by the schoolmaster, and if you adopted these local areas, I fancy you would be more likely to get local people interested than if you took arbitrary areas like the survey sheets. Another point is, that I think you could hardly carry out this large scheme without considerable local assistance. It would be of very great assistance if you could get residents in the districts to join in these memoirs. There must be a great deal of information that a geographer from London would have more difficulty in getting at than people who have lived in the locality all their lives. Of course, it must be added that you could not always take the opinion of every local antiquary, or person with a fad, about the place-names or objects of interest in a county; still, with their assistance, you could get hold of a great deal of local information. Another point is as to the time. It seems to me that twenty years is too long. As regards the physical features of a country, it is not of so much consequence, but if you go into agricultural statistics, and elements of that kind, it seems to me that it would hardly do to have your information for Sussex, say, for the year 1900, and for Northumberland 1920. You would probably have to find some method, if possible, of curtailing the time. The only way is by increasing the staff of people who give you information, and I think you would be more likely to gain that by means of local assistance. That is all the criticism I have to make as to the main point. I feel no doubt that we are all agreed that it would be of great advantage to the country as a whole that this work should be undertaken.

Mr. H. J. MACKINDER: I can only add my humble opinion to that of the two directors of the Ordnance Survey, that we must greatly admire both the largeness of Dr. Mill's view and the practical character of the discussion with which he has supported it. The point which strikes me, in the first place, is that twenty years is from one point of view too short, and from another too long, for such a work as this. The physical description will take many years to complete; but even that will require to be repeated after a certain period, in view of the advancing character of the cognate sciences, such as geology. But the statistical description will have to be revised after every census. Therefore, on account of the advance of knowledge, and on account of changes in the facts themselves, it appears that the work should be completed in less than twenty years, and that revision will subsequently be required. Dr. Mill's proposition has a very important bearing on the development of geography in this country. He is really directing our attention to what

that we may hear the opinions of experts upon them. If the plan is considered impracticable or inexpedient, I shall willingly let it rest until a fitter time. But if it is generally thought that the plan is a sound one, or is capable of such amendment as to make it satisfactory, a farther step must be taken, to consider whether Government could be urged to do the work, or whether the resources of scientific societies or the generosity of the not-impossible patriotic millionaire ought to be appealed to. The actual organization of the staff for carrying out the work may be left out of sight for the moment, but it should present no difficulty; there are very few professional geographers trained in modern scientific methods in this country, but, few as they are, they are to-day actually in excess of the demand for their services.

Before the reading of the paper, the PRESIDENT said: Dr. Mill is going to make a proposal to us, which, in my opinion, is of very great, almost imperial importance. I think, when he has read it, every one present will be of the same opinion, and it will probably lead to an interesting discussion. I will therefore not make any preliminary remarks, but will call upon Dr. Mill to address us on the proposed geographical description of the British Islands, based on the Ordnance Survey.

After the reading of the paper, the following discussion took place:—

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may be called "home-geography." Our geographical societies have given much attention to other lands; we are now asked to undertake the systematic investigation of our own country. This is a matter upon which foreigners often inquire of us in vain. Dr. Mill left the question of machinery for discussion by the meeting. We have already heard that there is very little chance of the Government doing anything. Though the Government should have the preparing of the Ordnance maps, the commenting on the maps is better undertaken as a private matter, though it might very legitimately have the assistance of a Government grant when shown to be of value. This description, it must be remembered, should be a work of art, not merely an accumulation of facts. There appears to me some danger, especially if the aid of persons living in the various localities be invoked, lest Dr. Mill's scheme should result in a heterogeneous heap of scientific bricks, in the place of a building on a consistent plan. The description throughout should be from the point of view of the geographer, not from those of various specialists, some trained in geology, some in botany, some in history. It appears to me that the result wished for would best be attained by the close co-operation of a group of men who see eye to eye, and are possessors of the same tradition. How that can best be ensured may be a matter of doubt, but with your permission, sir, I would like to express my idea upon the point. At the British Association Meeting at Ipswich, I ventured to express the opinion that a condition of further advance in English geography was the establishment of a central institution for the teaching of geography. Such an institution would be to geography what the Paris *École des Chartes* is to history. Now, research must go hand in hand with higher teaching. I believe, sir, it might be possible, if a real effort were made, to obtain in London, as an imperial centre, an institution working in harmony with this Geographical Society, and more or less controlled by it, which should have two sides to its work: on the one side, research; on the other, higher teaching. I believe, if some scheme were really worked out with these objects, that we could find some person with money and with imagination enough to give the necessary endowment as a nucleus. A large scheme is difficult to carry through; but a large scheme frequently captivates the imagination by its very audacity, and impels to the achievement of the end. It seems to me that you would get a large amount of research work done by students holding maintenance studentships. You would also have students coming from all parts of the country, and going back as schoolmasters and in various other capacities, with the point of view and geographical tradition of the central school, and also the local knowledge, so difficult of access to the non-resident. Thus, I believe, Dr. Mill's scheme could best be carried through, and could incidentally serve the purpose of creating a great school of English geographers.

Sir Benjamin Stone, M.P.: I came here rather as a listener, a patient listener, than to make observations of my own. I am rather afraid that recent observations have led me off the scent of the original paper; at any rate, I may be permitted to congratulate Dr. Mill on what he has laid before us, and would like to add words of encouragement for the carrying out of his idea. I confess there is a great deal of good in it if it is carried out in its entirety; at any rate, sufficient good in it, without help from Government or other sources where money is expected, for voluntary effort to do a great deal, and great enjoyment to be obtained. If Dr. Mill would put this into something like definite form, he would have done a great deal of good in starting the idea. There are serious difficulties in carrying it out in its entirety: the long time occupied in getting the information together, and the areas to be dealt with. My name has been mentioned in the paper in reference to this matter. I had some interest in taking part in the photographic survey of some part

of my own county, Warwick, which, in its elementary form, follows much the same lines as Dr. Mill proposes in his scheme. We took the Ordnance map, drew square lines across, reducing it to inches, and then we allotted the respective squares; for there is a large number of amateur photographers to be found everywhere nowadays, and spots of interest were indicated on these squares, where good and useful work could be done. In the course of two or three years, we have succeeded in getting a fair representation of the interesting matter in the county of Warwick. We have lodged in the free library at Birmingham about two thousand five hundred views, all done in permanent photography, that may be used for reference later on. During the process of that work, I confess that I have often been wishful that it should be supplemented by information on very much the same lines as described in this paper. You want to express in the text the facts that make the picture interesting—that opens the inquiry into place-names, physical conditions, ethnographical and ethnological matters, all of which should be recorded, many of which we have tried to put in pictorial form; but if such a scheme as Dr. Mill has mapped out could run side by side with such efforts as that, we might preserve invaluable material that is slipping away from us very readily at the present time, and that might be we can't tell of what use later on, because all scientific data are valuable in unknown directions. I don't know that the change brought about by facility of communication is reducing our type to one standard, but at any rate it reduces our language, and things of that kind, to much narrower limits than we are at first sight prepared to accept. We are losing dialect; many names are slipping away inadvertently through this change in education and the progress we are making. Take, for a single example, our board schools, on similar lines from one end of the kingdom to another, and these children learning the same language, common to the whole country, but dotted with dialects everywhere. One finds that in all parts of the country valuable information is going out of knowledge, simply because these dialects are dying out. They ought to be recorded, and any effort of this kind ought to have our encouragement in getting it into shape. I do not know what means Dr. Mill has behind him, but I hope this will not end with the paper. Don't trust to Government, or to some man dying and leaving you a large fortune, but put the scheme together, and you will find a large number of enthusiastic and well-meaning people anxious to give you information, invaluable in a few years hence. I can only congratulate Dr. Mill on what he has done, and wish it was in my power to do anything to further the object he has in view.

Mr. E. G. Ravenstein: I am sure we all desire that the scheme placed before us should be realized, and as some of us are advanced in years, it is to be hoped that it will be realized before the expiration of another twenty years, for if we are to wait so long, some among us may not have an opportunity of enjoying the fruits that are to be gathered during that long period. I am one of those who make light of difficulties, too light sometimes, and I don't think that the financial and other difficulties to be overcome are so very great. Remember that an encyclopædia, say in twenty volumes, quite as bulky as the proposed work, is written and issued in the course of four or five years, and it could be done quicker were it not necessary to spin the time out to suit the pockets of purchasers. The statistical account of Scotland was a private venture, and we hope that this thing will be a very superior affair to anything that could be produced a hundred years ago. You are aware that Government appointed and paid an editorial committee to bring out the 'Challenger Reports,' and I am sure that Government might be made to see the desirability of spending a like amount of money on a work of far more immediate importance to the people of this country, of greater interest to those who live in it, than the reports of the *Challenger* expedition. The materials are coming in

fast, being gathered now from day to day; the British Association are trying to carry out an anthropological survey of the British Islands, and are collecting information. The Geological Survey "we have always with us." Six or seven years before the last census was taken, the Statistical Society tried very hard to have this inquiry extended. They failed; but with a work of this sort in view, we could press upon the authorities with greater weight than the Statistical Society. Then, again, there is the agricultural department. At that time I told Sir Robert Giffen, that his agricultural returns were exceedingly useful to geographers, as they gave us something about the vegetation of the country, but that we wanted more detail; that he gave us counties, but that we should like to have parishes: as by adding, say, a forest in one corner of a county to that in another corner, the features of local distribution were obliterated. I was told that, in a census year, there would be no difficulty whatever in publishing the reports of every parish, and I have no doubt there are returns for years back, and we could make a comparison. There is one point on which I don't agree with Dr. Mill or Sir Charles Wilson, but with Colonel Farquharson. The sheets of the Ordnance maps are very attractive, but I don't think it would be wise to describe each sheet as a sheet. In the kingdom of Würtemburg, for instance, they have brought out a similar work in the form of a year-book, with general descriptions of the kingdom, and an account of every parish. That seems to me much better. Let us have the information Dr. Mill desires to give to the world arranged according to counties, as far as details are concerned, but let us have at the same time a number of volumes dealing with the facts on a broader basis, with climatology and so forth of the whole country; then taking separate regions, and dealing with these. This, I have no doubt, could be done exceedingly well, and would have to be done after the whole material for counties and parishes had been gathered. If you do the work by counties and parishes, you interfere, no doubt, with certain physical boundaries, but you interfere more if you take the limits of a sheet of the Ordnance Survey. In your regional descriptions, you will have to take boundaries more or less arbitrary. If you take the Pennine range, you will have to deal with it from various aspects, therefore you cannot draw sharp and fast lines and say: this we describe, and whatever lies outside we will not notice. You will secure another great advantage in taking the administrative county boundaries. If you take these counties and parishes, or groups of parishes—for there are parishes extending only over a few acres, whilst others occupy a whole sheet of the Ordnance Survey,—I say, then, if you take the county boundary and the parish boundary, you have two great advantages. One is this: that you place in the hands of the local teacher such a description of the county in which he lives and has his school as he can consult with great confidence, and take as a foundation for teaching, with great profit to his pupils, and great profit to the progress of geographical study. You have another advantage, a financial one. Nobody takes the slightest interest in a separate sheet of the Ordnance Survey—I don't think even Sir Charles Wilson does now, except as regards some of the older sheets—but we all take an interest in the parish we live in, we take an interest in the county we live in. There are many people exceedingly proud of their little counties, and if these could be made to take an interest in your work, they would help you financially. It is a patriotic work to produce such an account of a county, whilst a description of a sheet of the Ordnance Survey makes no appeal to patriotism whatever. I say, therefore, generalize, but go also into details, into what is called chorography and topography; take the existing boundaries, as known to the inhabitants.

The PRESIDENT: We have had a very interesting discussion, and I am very glad to hear that the principal officers of the Ordnance Survey are in favour of

Dr. Mill's scheme. For myself, I look on it as one of the greatest importance, and I trust that it may be combined with our plans connected with education in the way Mr. Mackinder contends for, or in some other way. I shall certainly bring the matter to the notice of our Council, and propose that the work of these memoirs should be carried on, under the auspices of the Council of the Royal Geographical Society. I shall ask them to appoint a small committee, in connection with the education committee of the Society, of experts on all the different subjects which would be combined in the memoirs, and that the Committee should receive instructions to find out and put themselves into communication with the innumerable institutions, in all parts of the United Kingdom, which occupy themselves in topographical and other work connected with the geographical memoirs, and also with the innumerable number of individuals living in many parts of the country, indeed, in every parish, who occupy themselves on one point or another which will be embraced in the memoirs. Such a Committee should also, I think, be asked to make an examination of all the materials, both general and local, which should be consulted, and they should consider the method of preparing the memoirs on the lines so well laid down by Dr. Mill. I think that Sir Charles Wilson's suggestion, that a sheet should be selected from a typical district before the scheme is officially decided upon, and that the memoir for that sheet should be published, with the whole scheme explained, with a view to attracting the public attention, is a good one. I should like, if there is time, to make a few remarks myself on the various details of Dr. Mill's scheme. We may divide the memoir into two parts—first, environment; and, secondly, the interaction of man on his environment. With regard to physiography, we should certainly, as Dr. Mill proposes, find a trained geographer to describe to us the type of land and the physical features of the region to be described. The elevations and depressions, and the mean elevation, would all be necessary in such a description; the drainage area, the soil, the minerals, and the climate. When we come to the interaction of man on such a country, we shall find the materials abundant. Of course, we should have our index and our list of place-names; and then we should come to the history of the disafforesting, the clearing, and the enclosing, for which there is ample material, at all events for many parts of the country. These operations had an effect on the climate, and on the movements of the population in various parts of the region described. We should then come to the question of drainage, reservoirs, and embankments; and then to the department of cultivation, of manufactures and trade, and the changes which have taken place—why Sussex has ceased to be an iron-producing county, why Suffolk and Norfolk have ceased to be the great manufacturing centre of England, and so forth. We must remember that each memoir must deal with the three statistical elements—the element of space, the survey; the element of number, the census; and the third, always the most important, the element of time; for it would be a very meagre account simply to tell about the population, cultivation, trade, and position of woods as they exist now. We want to know and compare these things with what they were a hundred, two hundred, three hundred years ago, back to the earliest period of history. The next subject, and, I think, one of the greatest importance, should be the question of communications. We should trace the directions of the Roman roads, and the causes why they took certain lines; then try to trace the *drengs*, as they call them in the north, the pack-horse roads of the Middle Ages—why they followed the Roman roads, why they left them, what directions they took, what markets they went to; then the coach-roads, the canals, and railroads. Lastly, we should consider the population, its movements, why it was thick in one part of the country in one period of our history, and almost depopulated in another;

and that would lead to the study of prices, markets, and trades. Numerous instructive details are to be gathered from Doomsday Book, from the Kirkby Inquest, from the records of the Poll Tax of the time of Richard II., and from other similar sources. In some places there is a solitary farmhouse where you find in the days of Richard II. a large village. Why has this movement of the population taken place? By collecting this material for the hundred, or the sheet, or whatever unit you like to take, and combining the information on a properly thought-out plan, you will produce a memoir of the very greatest interest—so interesting that the whole people of this country will be anxious that the work shall be completed. It ought to be completed in ten years, not twenty, because we must have a revision each census; therefore we must set to work to get it done in ten years. There is a vast number of people now occupied with studies of this kind, who, directly they hear a plan is formulated, will be anxious to give their help, besides numerous local institutions, which take their members about and describe different parts of the country and its history. We shall get help, no doubt, from some of the wealthier institutions, which will be willing to pay for work in their own parts of the country. No doubt wealthy individuals will also help. Then all these interests will form a leverage that will eventually induce the Government to grant subsidies for the completion of the work, which is of imperial interest. Other countries have not completed any such scheme, probably from want of funds, but the work has been done in India to a large extent. In the Madras Presidency there are memoirs of the collectorates, which formed the materials for Hunter's famous 'Imperial Gazetteer.' Of course, we shall expect that these memoirs, completed as Dr. Mill suggests, will lead to the preparation of histories of important larger districts, and eventually to a geographical description of the whole British Islands. I think that it is the duty of a Society like ours to take the lead in a great imperial work of the kind, and I think we all owe thanks to Dr. Mill for bringing so important a matter before us. Possibly Dr. Mill would like to make a few remarks before the meeting closes.

Dr. MILL: I may say that my ideas are purely provisional, and I am extremely glad that the opinions expressed have been so various, because it shows that the speakers took a vital interest in this subject. I shall consider them, and, if I can, assist in carrying on the scheme. I agree with Mr. Mackinder as to the importance of such a scheme from an educational point of view. I think that in the higher geographical education of this country field-work is extremely important. There are some calculations which must be made from the individual sheets, because in treating complicated lines of boundaries, parishes, and counties, one is liable to make mistakes, and the sheets, for the most part, are terminated by straight lines at right angles. With regard to the unit, the county or parish might certainly be employed, although it might be less convenient to estimate the average elevation of the parish as compared with the sheet, and similarly with regard to the measurements of the lengths of rivers.

The PRESIDENT: It now only remains to pass a very hearty vote of thanks to Dr. Mill for having given us an interesting meeting.

With reference to Dr. Mill's proposal, Professor H. G. SEELEY, F.R.S., writes: I entirely agree with the spirit of Dr. Mill's proposal that a complete description of our own country should be made as an expression of geographical knowledge. It would concentrate scientific interests which are scattered, accumulate facts of great value in education, and stimulate the whole population to observe and think about the conditions of industries and circumstances of the Earth's surface under which they are carried on. Such results would justify faith that the work, well done,

would be practically useful. The only differences of opinion are likely to concern the scope and method of the work, and the authority which should contribute the means to carry it through. The conception of geographical science and method which Dr. Mill adopts is the method which I have used for many years and tested in King's College, both in gaining knowledge and in imparting it practically. Dr. Mill's distinctive proposal is to apply this method to description of each sheet of the map known as the New Ordnance Survey, and to embody in each memoir as much as can be stated, concerning the Earth's surface and the people who live upon it. Such a description should, I think, be based upon personal knowledge of the districts described. It may be supposed to meet the wants of the younger people undergoing education, as well as of the adult producing population, landowners, occupiers, farmers, manufacturers, traders; and to give a summary, in a handy form for reference, of many of the groups of facts with which the geographer is occupied. From the educational point of view, the map-sheet is sometimes too large, sometimes too small. I have taught physical geography with the aid of these maps practically with the London Geological Field Class; and for ten years we have visited districts between the Chiltern Hills and South Downs. The area which can be studied practically in course of a day rarely exceeds 10 or 12 square miles. On this experience, I believe the facts described in relation to the map must always be such as can be actually seen in nature. Every teacher, even in the most elementary schools, must, I believe, make his own local description from the maps of his own district, and for that no book can ever be an adequate substitute. But the single-sheet map is too small for description, when the interest and meaning of such physical features of the country as streams or hill ranges can only become intelligible by tracing them into adjoining districts. Dr. Mill's second proposal, to generalize these details from the memoirs on the individual sheets of the map into a series of memoirs upon the different natural regions of the country, would be of great value if it could be carried out. I have had to prepare materials for some such memoirs for my lectures, but the only practicable method has been to describe the country on the basis of personal examination, grouping the phenomena mainly into those associated with rivers and valleys on the one hand, and those connected with hills on the other. In describing these physical features, it has been necessary in all cases to dissect the map and separate the valleys from the hills as results of geological structure and the circumstances of their origin. The natural divisions of the country which are suitable for description are only to be defined on the basis of geological structure. Any conception of the Weald of Kent, Surrey, and Sussex which did not recognize its relation to the Mendip Hills, would only partially express the knowledge of the practical geographer. Many of the physical characteristics of the people, and their industries and habits in relation to the land and its produce, admit of being recorded upon maps of smaller size. The map need be no larger than will show the registration area. I have used such maps to express the weight, stature, and other physical characteristics of the people, as well as observance of law and order, habits of thrift, and other characteristics for which data are available. But every such circumstance needs to be considered in relation to the several parts of the country and the industries carried on, otherwise the inference from statistics is often misleading. The heroic magnitude of the work makes its realization proportionately difficult, but I trust that the President and Council may consider means of giving effect to Dr. Mill's proposals.

Mr. G. G. Chisholm writes to Dr. Mill: If there had been time for me to say anything this afternoon on your "proposed Geographical Description of the British Isles," as you requested, I should first of all have expressed my very hearty appreciation of your magnificent scheme. I intended also to deprecate

any alarm at its magnitude, and to suggest that you should not say anything in advance tending to minimize its scope. I was glad to see that you looked upon your estimates of the magnitude of the work as mere guesses, for before the plan is finally matured and defined I think it would be well to submit the whole scheme to detailed consideration and discussion, and to seek the advice of representatives of various sciences interested in geography. I meant to make one or two suggestions myself as to the scope of the work, but merely as specimens of an abundance of topics that might be submitted for consideration and discussion if the whole scheme were laid before all those likely to be strongly interested in it. Taking your own conception of the final object of geography as "the true understanding of the interaction of man with his terrestrial environment" as the sound one, I am inclined to think that the part of the work that would be regarded with most interest when completed, is that which threw light on the changes that had taken place in that environment since these islands first appear in history. For that reason I was going to make the same suggestion as the President made as to the attention that should be paid to the progress of the clearing of forests, draining of marshes, and the extension of enclosures. I think that all the Enclosure Acts should be consulted, so as to get, so far as possible, the whole history of enclosures. Among other historical data that should be carefully noted on account of their geographical import, I think we should include the position and wealth of monasteries. I will give an illustration. Coventry is one of our oldest manufacturing towns. It has been a manufacturing town in some branch or other, or in several branches, at all periods of its history as far back as we had any distinctive manufacturing towns at all. Thorold Rogers, speaking of its early importance in this respect (in the fifteenth century, or even perhaps earlier), says that he can see no local reasons for this pre-eminence. Probably no really geographical reason can be given, and Dugdale is no doubt right when he attributes all the importance of the town to the wealthy monastery founded there in Edward the Confessor's time. Further, I was going to suggest that special attention should be given to historical notes as to the introduction of improvements in agriculture or the arts from abroad, either by foreigners who settled in England or by Englishmen who had travelled abroad. As to roads, too, there are many points of interest. A wrong idea is sometimes conveyed by descriptions of the frightful state of the roads in certain localities, the impression being conveyed that that was general in the times spoken of. There may have been very decent roads on the chalk (say along the Hog's Back or on the route of the Icknield Way, which seems to have been a track at a very early date), when the roads were as bad as bad could be on the Gault clay or on the shales between the now large towns of Lancashire and Yorkshire. As to the points to notice at the present day, I think it might be worth while to make inquiries as to the average size of fields in parishes or other localities. My reason is this. A large part of the success of foreign competition in wheat-growing at the present day is due to the ease with which modern agricultural machinery can be used over large expanses of unbroken level land. We speak of the competition of the United States, Canada, etc., naturally enough; but the really successful competition is restricted to certain favoured districts in these countries, wheat-growing declining in other parts of the same countries even more rapidly than in England. In the fen country we have stretches of flat country as good as any in Manitoba or Dakota, but probably hedges and ditches would interfere with their being cultivated in the same way as the Red River valley. For the sake of collecting information that might be utilized in any county, it might be well to draw up a list of works, to be read specially for the compilation of the proposed memoirs. In this, I don't doubt, a good deal of voluntary co-operation

might be obtained, as, I understand, is or was the case in reading for the Philological Society's dictionary. These general works would all have to be read before the first memoir was issued. I think there is a good deal in Mr. Ravenstein's suggestion of the county or the parish as the unit for description, on the ground that people have a special interest in their own county or parish, whatever it may be. I think, too, it would facilitate the obtaining of voluntary co-operation through the officials of the administrative counties. But, whatever be the larger unit, I think the parishes should all be separately described (preferably, perhaps, the mother-parishes), on the ground that the parish is really the unit of the economic development of the country. The utilizing of local co-operation should present no great difficulty. Of course, no local man would be asked to write an account of his parish according to his own fancy, but a carefully compiled list of definite questions would be submitted to him, and he would answer such as he could. There are a number of minor points I should be glad to talk to you about, but which are not worth writing about. As for the money, if the Royal Geographical Society supports your scheme as the Philological Society supports the English dictionary, which I hope it will, I have no doubt that all necessary funds will be forthcoming from the "not impossible millionaire" or millionaires.

THE DISCOVERY OF THE MOLUCCAS.*

By Dr. O. WARBURG.

According to two entirely independent versions, the discovery of these islands is ascribed to a Portuguese and to an Italian, and it is remarkable that the claims of these two explorers should not have been fully discussed before now, considering the immense influence the discovery must have had upon the political situation of the time, and its undoubted importance as a landmark of historical geography.

The story which until recently found universal acceptance rests on the accounts of the old Portuguese historians, and, in particular, on the 'Asia' of Barros. Barros was in possession of documents from the Indian archives, and from these reliable sources derived the detailed description of the fitting out of the first expedition to the Moluccas, to be found in his volume printed in 1561 (lib. 6, cap. 7). After the capture of Malacca by the Portuguese in 1511, Albuquerque at once despatched three ships with 120 men to explore the Moluccas. The chief command was entrusted to Antonio d'Abreo, and the two other ships were placed in charge of Francisco Serrano and Simon Affonso. Malay pilots were taken on board at Java, and the ships proceeded to Amboyna, and thence to Banda, where some profitable trading was done. Being prevented by stress of weather from reaching the northern Moluccas, d'Abreo returned to Malacca, and shortly afterwards sailed for Portugal, intending to present an account of his experiences to King Emanuel in person. He died on the voyage. Francisco Serrano had already lost his vessel by shipwreck on the voyage to Banda: at Banda he bought a native junk, which was also lost on the return voyage. With great difficulty he reached Amboyna, whence he was called to assist the king of Ternate against the king of Tidore; he followed the sultan of Ternate to the Moluccas, attained great influence, and settled there permanently. Serrano's letters to his friend and relative, Magellan, were the means of inducing the latter to undertake his famous voyage round the world; but he did not live to see the arrival of the remainder of Magellan's fleet, dying by poison in the year 1511.

* Abstract of Paper read at the Berlin Geographical Society, February 8, 1896.

According to this version, which is accepted by all the Portuguese, Spanish, and French historians of the following century, d'Abreo is the discoverer of Amboyna and Banda, and Serrano of the northern Moluccas. More modern writers, such as Crawfurd, Soltau, Berghaus, Peschel, Major, Bokemeyer, and many others, give the same story; nowhere do we find a hint that the Moluccas had been previously visited by Europeans, nor any suggestion of a different account existing. Nevertheless, in the narrative of the great journey of Ludovico Varthema, first published in Rome in Italian in 1510, that adventurous traveller gives a detailed description of a visit to the Moluccas made in the year 1505, in company with certain Nestorian Christians. Setting out from Sumatra, in fifteen days they came to the island of Banda, in twelve more to Monoch (Molucca). From Molucca Varthema went to Borneo, and thence to Java, 200 miles from Molucca and five days' journey from Borneo. From Java he returned to Malacca, and reached home, after many adventures, in 1508.

Varthema's book produced a great impression in Europe, as may be gathered from the fact that no less than thirty-six editions are known to have been published in various languages during the sixteenth and seventeenth centuries alone, and it is therefore surprising that the Italians should have failed to maintain the claims of their countryman to priority, leaving it to Dutch geographers and historians of modern times to recognize in Varthema the true discoverer of the Moluccas. A comparison of dates would nevertheless seem to dispose of the question, were it not that a close examination of Varthema's account gives rise to suspicions of his veracity, ultimately leading to the conclusion that the distinguished traveller never visited the Moluccas at all, but based an account of them on hearsay and imagination. The descriptions of the nutmeg and clove trees, for example, render it inconceivable that the writer had ever seen either; the nutmeg is as little like a peach-tree as the clove-tree is like a box-tree. Again, we are told that Banda is a single island about 100 miles in circumference, very ugly and gloomy, low and flat, wherein the seasons are the same as ours! The inhabitants of the Spice islands are further described as heathenish, bestial, stupid, and feeble in mind and body, having no king or government, whereas we know the Bandanese as a race of capable, intelligent traders, who even in Varthema's time were partly Mohammedans; and the same is true of the natives of the Moluccas themselves, who are nevertheless stated to be even lower in type than the Bandanese. Finally, by his own showing, it appears that the journey could not have been accomplished, in the miserable Chinese sampan described, within the time named.

In the Hakluyt Society's edition of Varthema's travels, the difficulty of bringing the narrative into accord with known facts relating to Java is sufficiently obvious, and we must leave Varthema out of the running in the competition for the honour of discovering the Spice islands.

THE GEOGRAPHY AND RESOURCES OF BRITISH CENTRAL AFRICA.

By ALFRED SHARPE.

In 1894, Sir H. H. Johnston, Her Majesty's Commissioner and Consul-General, read a paper before the Society, describing British Central Africa, and showing the advance which had been made during the three years of his administration. I feel, therefore, that I am at some disadvantage in treating of the same themes after so short an interval.

British Central Africa—that is, the portion of Central Africa belonging to Great Britain which lies immediately north of the Zambezi—may be roughly divided into two parts: eastern and western. The former is bounded by the Shire and Nyasa on the east; by German and Free State territory and by the south end of Tanganyika on the north; by Mweru, the Luapula river, and a line drawn south to the Zambezi at the Loangwa mouth on the west; and by Portuguese territory on the south. The western portion contains the Barotse, Mashukulombe, and other countries, and is chiefly watered by the Upper Zambezi affluents and the Kafue. Of this western portion I know nothing—from personal observation. It is the eastern section of which I am to speak, and which I will refer to, for brevity's sake, as B.C.A. Perhaps the chief noticeable feature about this country is the large amount of navigable waters which it possesses. Its actual boundaries, roughly measured, reach to some 1900 miles—that is, including, for geographical consideration, the Portuguese country lying north of the Zambezi; and out of this distance, some 1200 to 1300 miles can be travelled by boat or by steamer. Commencing at the junction of the Shire with the Zambezi, we have steamer communication to the north end of Nyasa (with a 60-mile break at the Shire highlands); we can sail across the foot of Lake Tanganyika; from the north end of Mweru we have communication by boats for the length of that lake and up the Luapula river to lat. 10° 30′ 46″; from the northern end of Lake Bangweolo, again, we could boat down to about lat. 12° 30′ on the Luapula; taking advantage of the lower portion of the Loangwa, we could then navigate that river and the Zambezi (with one portage) back again to the Zambezi-Shire junction. I believe, also, that the Chambezi river will prove to be navigable for small craft for a considerable portion of its length before entering Lake Bangweolo, as the difference of level between that lake and the Chambezi sources on the Nyasa-Tanganyika plateau is probably not more than some 200 feet; and Awemba people, through whose country the river runs, have told me that long journeys are made by canoe on the river. With the exception of the Shire, Luapula, Loangwa, and Chambezi, I know of no other rivers in the country which are navigable for any useful distance.

The greater part of B.C.A. is high-lying plateau land—almost the whole of it, we might say—situated at elevations of from 3000 to 6000 feet, the only low portions being the countries lying near to the shores of Lakes Nyasa, Tanganyika, and Mweru, and the valleys of the Shire, Luapula, and Loangwa rivers.

With regard to the drying up or otherwise of African lakes and rivers, I am inclined to doubt the theory that there is desiccation of a permanent kind going on—that is, I mean, a drying up due to a *permanently decreasing rainfall*. It is, I think, more reasonable to suppose that, owing to some cause which is not as yet apparent, there

are regular cycles in the lake regions of Africa, due to increasing and decreasing rainfalls. The knowledge which we possess of the rises and falls of Tanganyika certainly goes to show this. Lake Mweru is being rapidly *silted* up at its southern end by the Luapula river; the vast marshes which exist there were formerly part of the lake. The great Mweru marsh, lying to the east, was also a lake comparatively recently. It appears to have dried up, or rather to have become marsh, from the same causes which are now converting Lakes Shirwa and Pamalombe into marshes, *i.e.* one or two unusually dry years have allowed vegetation to get a hold in their shallow muddy bottoms; and, once so started, the growths rapidly spread. From what we know of Bangweolo, it appears to be filling up in the same manner, at its southern end at any rate, and this will probably be due to the silt and vegetable matter brought down by the Chambezi river. With regard to Nyasa, there have been changes of considerable magnitude in the level of that lake during past ages, as shown by the number of beaches, one above another, and by water-marks on the rocks. I do not think there has been much recent change in its level, though during the last year or two the exit of the Shiré river from the lake has become more difficult (more shallow) for steamers.

As to the Shire river, one hears many conflicting opinions expressed by those who navigate it. I think myself that there has been little *permanent* change in it since Livingstone first ascended it. We have good years and bad ones, sometimes two or three bad ones in succession, and at such times the opinion grows that it is becoming shallower. In any case, we may always look on Chiromo as the farthest point of navigation for steam traffic. During the rains steamers can at times fetch Katunga and Chikwawa, but during two-thirds to three-fourths of the year Chiromo is the farthest point which can be reached; and, indeed, there are times when steamers are compelled, by the lowness of the river, to discharge their cargos at Port Herald, some miles below Chiromo.

I have recently received from Lieut. Gurney, R.N. (who was for some time in command of the gunboats on Lake Nyasa), a chart showing the interesting results of his soundings with the deep-sea apparatus on the lake. From this it will be seen that in the upper (northern) half of the lake, there is a line of soundings where no bottom is found at 1800 feet (300 fathoms). As the surface of the lake is some 1500 feet above sea-level, we thus perceive that the bottom of Nyasa is more than 300 feet below the level of the sea; how much more we cannot at present say, as the gunboats were only supplied with 300 fathoms (1800 feet) of wire. What conclusion can be drawn from this curious fact, or whether it is likely to assist in the settlement of the question as to how Lake Nyasa was originally formed, I leave to other more scientific persons to say. In the portion of the lake where the greatest depths were found, it is notable that the mountains on

either side rise to a great height. The ranges behind Ruarwe are over 6000 feet above sea-level, and the mountains on the east side opposite Ruarwe, reach to about a similar altitude. It will be observed that the southern half of Nyasa is considerably shallower than the northern portion, and also that the mountains on either side of the lake are there lower than in the northern part. At the extreme north, the mountains rise on the east to fully 10,000 feet, on the west to some 7000 feet; but although the lake is there deeper than it is at the southern end, it does not reach the extreme depths found opposite Ruarwe. It is, I think, possible that this is due to the fact that the

THE ZAMBEZI NEAR CHAPINGA.

numerous large rivers entering the lake at its northern extremity have deposited sand and mud for a long distance out, and that the true bottom of the lake at the north end may have been deeper than in any other part. Lakes Nyasa, Tanganyika, and Mweru in their leading features are much alike; they are all clefts or dykes in a high-lying country, of considerable length and little breadth.

At the north end of Nyasa there is an interesting volcanic region, covering an extent of about 30 miles by 20, in which are found numerous craters of all sizes, from small mounds of 40 or 50 yards in diameter at the base, to Rungwe mountain, the topmost crater of which is some 8000 feet above sea-level. None of these are active in the slightest degree, but there are numerous hot springs in their neighbourhood. The district is enclosed by the high ranges east and west of the lake, which at its north end gradually curve round and join, forming

a bow, to the north of Nyasa. Rungwe itself is about the centre of this volcanic region. I ascended to within some 1000 or 1200 feet of its summit in 1889, and passed three large craters on my way up, one of which was partially filled with water. Some of these small crater lakes are very beautiful, notably one locally known as Kiziwa. The greater part of this volcanic country is within German territory. The surface of the ground has much pumice-stone in it, but the soil itself is very rich, and well suited for the growth of coffee.

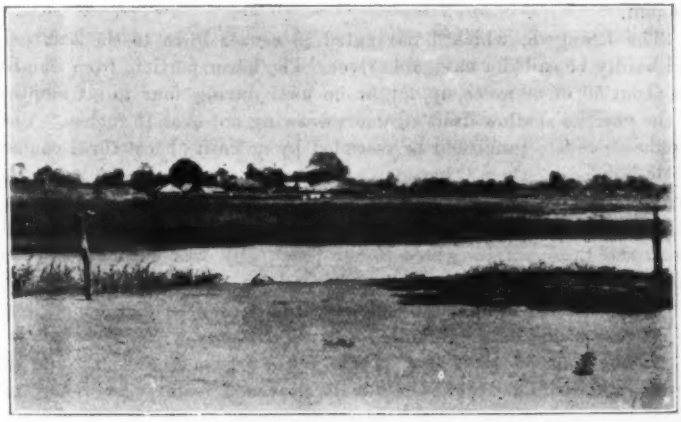
Mlanje mountain, in the Shire highlands, is the highest which has been actually ascended in B.C.A. In the end of 1894, together with Captain Manning, I climbed to the topmost peak, which we found to be 9680 feet above sea-level. Sir H. H. Johnston has already described the characteristics of this peculiar mountain range, and has spoken of the forests of cypress which exist there.

In 1889, I made a journey from the Shire highlands through the countries lying north of the Zambezi, towards the Loangwa river, reaching as far as Undi, and passing through the northern portion of Makanga country, and through what was, a century or two ago, known among the Portuguese as the "Maravi" kingdom. Parts of Makanga and Maravi are rich in minerals. Gold has been obtained in small quantities in the river-beds for some hundreds of years past by natives, and I was informed of the existence of silver, tin, and copper. The people who centuries ago carried on such vast gold-mining operations in Matabeleland and Mashonaland do not appear to have worked north of the Zambezi. I have seen myself, in the Maravi country, remains of alluvial workings carried on by Portuguese half-castes some fifty to a hundred years ago; but I have never seen or heard of any old workings in quartz reefs north of the river. It is not beyond the bounds of possibility that payable gold-fields may be discovered in British Africa immediately north of the Zambezi.

Throughout the greater part of this journey I travelled through pleasant high-lying country, with a comparatively healthy climate, the general elevation being from 3000 to 4000 feet above sea-level. An account of this journey appeared some years ago in this Society's *Journal*.

In 1890 I travelled from Leopard bay, on the west shores of Lake Nyasa, through elevated plateau land, between the lake and the Loangwa river, and followed that river down to its junction with the Zambezi at Zumbo. The country between the lake and the Loangwa is mostly high and occupied by "Angoni," a remnant of some Matabele who crossed the Zambesi and travelled northwards about fifty years ago. The history of their migration, as given by some of the old original immigrants, is an interesting one. They spent a number of years wandering from one district to another, and eventually settled down in groups in the high country west and east of Lake Nyasa. In the first instance, they travelled up the west side of that lake

until they reached the north end, from whence they went north-west through the districts of the Awemba tribe, to the south end of Lake Tanganyika. Subsequently they retraced their steps, and settled for a time in the Awemba country. That tribe adopted many of their customs, especially their way of fighting, and, becoming too strong for the Angoni, drove them out. The latter then divided at the north end of Lake Nyasa; a large detachment went down the east side of the lake, settled in the high country there, and are now known as Magwangwara. The rest again descended the west side of Nyasa. Some of them, under two or three powerful chiefs, established themselves in



PORTUGUESE CHIROMO, ON THE RUO.

what is known as Mombera's country; another division proceeded still further south, under a chief called M'peseni, and fixed themselves in the northern portion of Undi's country, where they now are; while a third division under Chikusi subsequently settled at the sources of the Revubwe river.

Throughout all these high countries inhabited by the Angoni, there are only a few of the original Matabele left, as much intermarriage with local tribes has gone on. They still keep up the Zulu war customs, fight with the spear and shield, and decorate themselves with feathers, skins and tails of leopards, cats, etc. Their business is war, raiding other weaker tribes, and catching slaves; and wherever Angoni are settled there is always found a belt of uninhabited country surrounding them, immediately beyond which the local tribes lead a wretched existence, their huts built in rocky hilltops, their food gardens situated in the most inaccessible places, and tilled in fear and trembling.

It is curious that, from the southern extremity of Africa to the Nile

itself, there is found a succession of tribes more warlike than the general run of Africans, with similar customs and characteristics; they are cattle-keepers, fight with the shield and spear, live only in high country, are professional raiders, and despise agriculture. Commencing with the Zulus in the south, we come to the Matabele, the Angoni, the Awemba, the Masai, and others. The only tribes in B.C.A. who have been able to make any stand against these are such as have acquired guns and gunpowder; and in this particular respect only it might almost be said that guns and powder have done some little good in B.C.A., as in one or two instances local tribes have by this means been enabled to retain their countries, though harassed by the Angoni.

The Loangwa, which I navigated in canoes down to the Zambezi, can hardly be called a navigable river. The lower portion, from Zumbo for about 50 or 60 miles up, might be used during four to six months of the year by shallow-draft steamers drawing not over 15 inches. The rapids above Chirowe could be ascended by no craft (I lost three canoes while descending them); but above the rapids, upwards to Muliro, small shallow-draft steamers might ply for a few months during the rains. The current, however, throughout is very strong. When I travelled down the Loangwa, its whole course practically was uninhabited, the valley having been raided and devastated by Zambezi half-castes. I saw the remains of numerous burnt villages, skulls, and bones, but hardly any living inhabitants.

In the end of 1890, I made a journey from the south end of Tanganyika to Lake Mweru and the Katanga country, a report of which has also appeared in this Society's *Journal*.

In a subsequent journey which I made to Lake Mweru in 1892, I circumnavigated that lake in a steel section boat, and followed the Luapula river up to its cataracts in lat. 10° 30′ 46″. The Tanganyika-Nyasa plateau has already been described in papers read before this Society by Sir H. H. Johnston and others. When one leaves Tanganyika and proceeds west to Mweru, the country passed through is hardly so suitable for any attempts at settlement by Europeans as the Tanganyika-Nyasa plateau. Not only is the elevation rather lower, and the climate in consequence warmer, but also there appears to be in Itawa a longer dry season, and a severer wet one. Itawa is a country of vast plains and swamps for the most part. Lunda again (Kazembe's) is a very fertile, though comparatively hot, country, well watered by permanent streams of running water, and having a more luxuriant vegetation than the districts lying north of it. At the south end of Lake Mweru, on the Luapula, and on the island of Kilwa, the oil palm flourishes. This was probably brought from West Africa, as Kazembe's ancestors came from the Kasai river.

Uwemba, the country of the Awemba, from what we as yet know of

it, seems to have large districts possessing a pleasant mild climate, where coffee, wheat, and other useful products might be grown by Europeans. It has been difficult hitherto to enter this country, owing to the desire on the part of the Arabs, who visit it, to keep us out as long as possible. They have used their best endeavours to persuade the Awemba to exclude us. During the last two years, however, a great deal has been done towards opening up friendly relations with the Awemba by Mr. Poulett-Weatherley, who has been travelling, hunting, and collecting in the borders of their country, and who has acquired considerable influence with them.

In the districts east of the north end of Lake Mweru, large quantities

UPPER SHIRE RAPIDS.

of salt are made by the natives. Salt-impregnated earth is collected and carried into the villages; here every one is a salt-maker. Large funnels made of twisted grass rope are placed on stands; the funnel is filled with salt soil, water is poured in, and the mass well stirred up. The water filters through, and drops from the bottom of the funnel into earthenware pots placed below. This salt water is then boiled, and the water evaporated. A certain amount of dirt remains with the salt, but the African has no objection to that; he likes this home-made salt better than our own white table salt. Itawa salt is carried to places far distant, even to Nyasa, and is exchanged for hoes, cattle, wives, and other African barter. It would, of course, have no value for export, but is a source of wealth to the natives.

From 1887 to 1890 I was chiefly employed in travelling and

hunting. At that time there were still left considerable numbers of elephants in the Nyasa districts, and most of my shooting was done within no great distance of the lake. The elephant is gradually disappearing in B.C.A. This, however, is not due to the number killed by Europeans (which, as a matter of fact, is very small), but to the fact that the natives throughout the country are constantly destroying them. In the marshes round about Lake Mweru considerable quantities are still to be found, and, of course, farther north they are yet plentiful. In B.C.A. it is necessary to take out a £25 licence for the hunting of elephants; but in a country where stations are so few and Africans so plentiful, it is no easy matter to keep a check on native hunters.

The coffee-planting industry of the Shire highlands has steadily grown. This district lies, roughly, from 60 to 100 miles south of Lake Nyasa, in S. lat. 15° to 17°, at an average elevation of some 3000 feet above sea-level. Dr. Livingstone chose it as being suitable for an experiment in Central African colonization. He held the opinion that it was possible, in what appeared to be healthy, high-lying country, to form colonies of Europeans—and undoubtedly he could not have chosen a more suitable district for such an experiment. The existence at the present day of this thriving young British settlement is due in the first instance to missionary enterprise. The prospects of the new industry are very hopeful. For several years the export of coffee has been doubling itself, and although the total amount which has been exported during the past season is trifling as compared with that from large coffee-producing countries, it is possible, I think, that at some future date B.C.A. may be one of the great coffee countries of the world. It is not only that the plant grows well, produces a fair average crop, and is as yet free from leaf disease, but also that suitable land is cheap, and the cost of transport to the coast moderate. The chief point, however, about coffee cultivation in this country is that native unskilled labour is very cheap, and the supply practically inexhaustible.

With respect to this question of a supply of unskilled labour within tropical Africa, it has been stated that, judging from the experience of explorers and others who have spent many years of their lives in Africa, the negro will never be brought to work regularly except with a system of forced labour or under the pressure of slavery. This is in complete opposition to actual experience in the Shire highlands. This district offers an object-lesson to all who doubt the native African's capacity for work. The settlement is now some twenty years old, and has passed far beyond the experimental stage. If there is one question which has been proved thereby, it is that we need have little fear, in Central African settlements, of a scarcity of unskilled labour, and also that we can depend, in course of time, on a certain amount of moderately skilled labour. Our experience has been that there are three stages of the labour question: in the first instance, when

undertakings requiring unskilled labour are commenced, there is a scarcity until the natives have gained confidence in the new settlers; then there is a great flocking in of local people. After a time many of the immediately local men begin to learn skilled work, such as carpentry, timber-sawing, brick burning and moulding, bricklaying, overseering, bullock-driving, etc. They soon perceive that such occupations involve less irksome toil, have some interest, and command much higher wages than mere unskilled labour; meanwhile the news that calico and other valuables are to be earned has spread, and every year natives come in from more distant districts to obtain unskilled work. These people agree to work for a fixed term of six months, at the termination of which they

SOUTH END OF LAKE NYASA.

return to their own homes simply because they want to make use of the goods they have earned, and to till their land. It has been found at Blantyre that the same men return again and again in succeeding years. Wives and families have to be supported and looked after in Africa just as much as in our own country, and also the negro is, in his own way, as eager about returning to visit his home as we are. Having by his half-year's work earned enough calico to clothe himself and his family and to purchase what articles he may require, he sets to work to clear and plant his own food-garden, without which his people would starve; probably in the following year he will come again to Blantyre or elsewhere for work. So far from there being any scarcity of labour in these regions, during the year 1894, in spite of the large increase of planting operations, more labourers came into Blantyre from

Lake Nyasa than could be well utilized. The supposition that natives living immediately round the European settlements decline all work is an incorrect one. It is quite true that there are few such who can be relied on to do the field work of raw hands. They not only—as I have already stated—learn skilled work, but also undertake the serious question of food-supply; large quantities of grain are grown in the Shire highlands by local natives with the sole object of sale to the incoming labourers. Under a stable government, even the African cannot live without doing a certain amount of work; otherwise, although he might have no great difficulty in obtaining his food, he would be unable to procure his own calico and the gaudy prints and handkerchiefs which his wives and family require, all of which, in the more settled districts of B.C.A., have now become necessaries, and are no longer luxuries. The labour supply in the Shire highlands has grown gradually with the demand. If there had been a sudden very large demand required at once, it would have been difficult to supply it. Thus it is possible that, in railway construction in Africa, some introduced labour might at the commencement be needed.

With regard to "gin, guns, and gunpowder," none of these articles are allowed to be sold, given, or disposed of throughout the greater part of our Central African territories. Within B.C.A., the bulk of the native population have never seen, tasted, or heard of imported spirit. Alcohol has never been an article of commerce in British Central or East Africa, and the natives, with the exception of those who live on the coast or who visit it, have no desire for it.

It has been said that tropical Africa is capable of only a limited degree of development; that throughout the continent natives acquire all the vices and none of the virtues of Europeans in whose neighbourhood they may have built their huts; that little progress has ever been seen in tropical Africa; that the natives have not progressed, but have deteriorated, wherever they may have been long in contact with Europeans; and so on. These are undoubtedly pessimistic views, and are as incorrect and harmful as the ultra-optimistic ones. For my own part, I can only speak of B.C.A. Within that portion of the continent, however, I can confidently say that the country is capable of very great development, and that the natives have *not* deteriorated through their contact with Europeans; they have, on the contrary, much improved, and have adopted a certain amount of civilization. We have already a revenue of over 10,000*l.* for the B.C.A. Protectorate; exports and imports are steadily increasing; we have a settled agricultural industry; the influx of a good class of European settler continues; labour is plentiful and cheap; traders and planters find that they can profitably invest money in the country; steamers ply on the rivers and lakes, and freights have gone down some 50 per cent. within the last year or two; the main roads have been improved and rendered safe, and journeys

can be made in half the time they occupied a few years ago; and our total trade for 1894 amounted to £80,000,—all of which shows *progress*, I think.

With regard to the native. In districts around or near to our settlements, in place of constant warfare and slave raids he has peace and an appeal to justice; he lives in better houses than he did; he clothes himself in calico, prints, and in some cases European manufactured garments, instead of bark cloth and skins; he has formed permanent settlements round our stations, and is relying more on settled occupations; and he has also taken, as I have said, to skilled and regular work.

YAO VILLAGE, BLANTYRE.

Large numbers of children attend the mission schools, and a considerable portion of the rising generation in the neighbourhood of the missions are able to read and write. Native agriculture has increased, and some of the more ambitious have, in the Blantyre and Zomba districts, gone in for the cultivation of coffee and wheat. Native boys have taken readily to telegraph work (and I might mention that, at the time of my departure from Blantyre, the telegraph office there was in sole charge of an African, who had been taught his work by one of our Sikh telegraph operators); and I have little doubt that, as the African trans-continental line is carried on, it will be found that most of the operating will be done by Africans under European inspection. We have also a staff of native heliograph workers.

The only natives with whom we have had trouble and fighting in B.C.A., and to whom our presence is distasteful, are the Yaos. This

tribe is one of professional slave-traders, and many of them live by robbery. They inhabit the country lying east of the Shire and Lake Nyasa, and are gathered round several powerful chiefs, whose towns are centres of the slave trade, and calling-places for Arab and other coast caravans going to and from the interior. Hitherto our experience has been that when any one of these chiefs has been subdued by us, the greater part of his people settle down quietly under our rule; but until each one has been separately dealt with, he remains our enemy. One of the most difficult matters which had to be dealt with as trade increased in the Shire highlands, was to put an end to highway robbery carried on by Yaos. These people, in bands of fifteen or twenty, armed with guns, would lie in wait on any of our main roads, and would attack the first band of unarmed porters passing with merchandise. Many hundred pounds' worth of goods have thus been stolen, and a number of lives lost. The detection of the actual culprits in such cases is practically an impossibility, though we are able to find from what districts or towns they come. I am glad to say, however, that, owing to the worst offending chiefs having been summarily dealt with, our principal roads have now become almost free from attempts of this kind.

Apart from African natives, European settlement in Central Africa is, of course, distasteful to the Arabs. In such parts as we are too strong for them, they may settle down for a time under our rule, or else remove to more remote districts; but a very difficult question in tropical African colonization will always be—*what to do with the Arab*. His mode of life, his ideas, and all his instincts and interests are opposed to ours; and it will probably need sufficient time for a new generation of the African Arab to have arisen before we cease to have difficulties and troubles with him.

The people inhabiting the countries of Ulungu and Itawa use the word "Tanganyika" as implying a large piece of water, just as the word "Nyanja," or "Nyasa," or "Nyanza," is used in other parts of Africa. The word "Mweru," again, is used by the Lunda people as simply meaning the same, and does not of necessity apply to any special lake. In Itawa the lake which we call Mweru was frequently spoken of to me as Tanganyika. On the upper Luapula, Bangweolo was called Mweru, Mwelu, or Mwelo, *i.e.* simply "the lake." I found no natives who knew the word "Bangweolo." As I have previously suggested in this Society's *Journal*, I think that the expression used to Dr. Livingstone would probably be Pa Mwelo, *i.e.* "At the lake." If these two words are pronounced quickly, it will be seen that there is a great resemblance to "Ba-Ngēolo," as a native would pronounce it.

Up to the present day there has been practically no prospecting for minerals in B.C.A. Any of those who casually looked about for signs of gold have been without special knowledge. Iron, of course, exists almost everywhere; probably no country is richer in iron than this

portion of tropical Africa; but, needless to say, iron has no commercial value in such a country and so far from the coast. During 1894 extensive beds of coal were found, not far from the navigable portion of the Shire river, and it is quite possible that at a future date this coal-field may turn out to have a commercial value.

The question of a possible colonization of some portions of the high-

THE PEAK OF CHEZA, IN THE MLANJI HILLS.

lying plateaux of tropical Africa has been of late much discussed. At the Geographical Congress held in London in July last, a very interesting paper was read on this subject by Sir John Kirk, and various views were expressed in the discussion which followed, but not much mention was made of the only successful agricultural settlement which at present exists within tropical Africa north of the Zambezi—I mean the Shire highlands. Yet the results and experience gained in that district

afford us almost the only really reliable data on which we can go. It is, I think, doubtful if Europeans will ever be able to form permanent colonies in Central Africa of the same description as we have in New Zealand, Australia, and South Africa. Colonies, I mean, to which emigrants could go, and which would form an outlet for the surplus population of European countries. It is absolutely essential for the establishment of such colonies that families can be reared in good health, without having to be periodically sent out of the country to lower latitudes. It would, of course, be rash to say that such colonization is *absolutely* impossible in any portion of tropical Africa north of the Zambezi, but such experience as we have at present goes to show that we cannot expect it. In the Shire highlands, I think we have as good a climate as will be found in any of the elevated plateaux of Central Africa, and what has been found there is, that no matter what height Europeans go to, they are still subject to periodical attacks of fever. Intermittent fever does no great harm, and to some extent one becomes inured to it. Remittent fever, however, is a far more troublesome type, and the worst of all is hæmaturic or black water fever, which seems to make its appearance sooner or later in any part of Central Africa where Europeans settle.

The Shire highlands have shown quite clearly, however, that, given certain conditions, we can form successful colonies of a certain type in tropical Africa, more like those we have founded in such countries as Ceylon, Burma, etc.; and the more knowledge we get of tropical Africa, the more convinced we cannot fail to become that enormous districts are bound to be eventually, in one way or another, exploited, settled, or colonized. It matters little, I think, what particular word we use; things will shape themselves—as they have done in the Shire highlands. Cheap and easy communication and transport are, of course, the first great and absolute essentials, without which we can do little or nothing.

B.C.A. is in itself a rich country, both in minerals and for agricultural purposes. Indeed, when tropical Africa is compared with India, the former, so far as the country itself is concerned, is the richer one; but its poverty lies in the fact that it has no indigenous industrious race, while the wealth of India is created by its inhabitants. The African, in his uncivilized condition, not only produces next to nothing, but has little ambition to acquire wealth, nor has he many wants. This, no doubt, is largely due to the fact that for centuries past he has never known what it is to have permanent peace. If he could be imbued with a spirit of industry and a desire to accumulate wealth, such as the Indian has, tropical Africa would soon become one of the richest countries of the world.

Much has been done within the last few years to put an end to the slave trade in the Nyasa districts. This, of course, as every one knows,

is one of the most difficult questions which is encountered in Africa. It is sometimes thought at home (though perhaps less so now than formerly) that it is only the Arab who makes slaves, and that all Africans are merely sufferers in this respect, who would be only too glad to put an end to slavery for ever. This is not a correct view, and, as a matter of fact, the African is not by any means free from blame in the matter. Slavery is one of the great institutions of Africa, and if no Arab were to enter the continent from to-day henceforth, there would

FALLS OF THE RUO.

still be many slave raids, and thousands of slaves. Among the worst offenders in this respect are those tribes who visit the coast from time to time for trading purposes. Compared with the frightful cruelties of a slave export trade, domestic slavery in Africa cannot be looked on as a very great evil. In either case the slaves are procured for the greater part by raids, but the subsequent lot of the domestic slave is not a hard one. It will be a long time before domestic slavery can be done away with in any Central African possessions; but when, in any

one of them, we can say that we have succeeded in totally abolishing the export of slaves, we shall have much to congratulate ourselves on. All systematic transport of slaves across Lake Nyasa has now been done away with. Formerly, no doubt, large quantities were crossed from the west to the east side, some in dhows, a few in large canoes, at one or two of the narrowest places. The first blow to this transport was the placing of gunboats on the lake. Subsequently stations were formed at the principal crossing-places; and finally, all the dhows used in the traffic have been taken over by the Administration, which now works regular ferries from Government stations. By this means every

NATIVE WOMAN ON ZOMBA SLOPES.

facility is given to caravans or to natives, whose objects are not illegal, to cross from one shore of the lake to the other; but all attempts at slave transport are put a stop to.

B.C.A. offers a field at the present time to planters with limited capital, provided that they are willing to work hard themselves, to dispense with any highly paid assistance, and to put up with a life which offers very little in the way of recreation, and next to no society. The lot of a coffee-planter in the Shire highlands, however, is becoming a somewhat pleasanter and easier one than it was a few years ago. Most of the plantations as yet opened are within reasonable distances of Blantyre, which has thus become a commercial and social centre. This township has a number of excellent stores, where almost all goods in demand in the country can be procured at from fifty to

eighty per cent. above home prices. We now have there a club, hospital, literary society, planters' association, bank, shooting-club, post office, telegraph office, hotel, and various other institutions; and, the roads having been greatly improved, it is no longer difficult for settlers to visit one another, and to meet in Blantyre. Horses, if brought quickly from the coast to the highlands, and well cared for on the journey, do well when once in the hills; several foals have been born in the country.

The climate is not a hot one. There are, throughout the country, two levels—the one, the low level, being the line of the Nyasa "trough,"

STREAM AT FORT LISTER, MLANJE.

together with the Shire valley; the other, the high level, being actually the general altitude of this part of Africa. Immediately on leaving the Shire valley, or Lake Nyasa, one mounts to an altitude of from 3000 to 5000 feet (or more in some parts). The climate of the high levels is almost a European one, in which, for a great part of the year, the same clothes can be worn as would be used during an English summer. Nyasa and the Shire form, in fact, a *rent* through high lands. As soon as the low strip of country near the shores of the lake is crossed, steep wooded hills are climbed, until, at about 4000 feet, more open country is reached, with wooded gullies and large stretches of grass-covered "feldt." Streams of clear cold water run down every little valley, and cool breezes always blow. Much of this high country is admirably suited for settlement by Europeans—for "permanent colonization," in fact, if only there could be found some preventative of the

various forms of malaria. As I have already stated, these complaints prohibit permanent residence in the country as far as we are yet able to judge; but except on this question of *health*, there is nothing to prevent permanent European colonization. The climate is pleasant, and necessaries of life are plentiful and cheap. It is a country which, except for fever, would thoroughly suit South African Boers or people with similar tastes. In the high parts of B.C.A. cattle and horses thrive, and there is no tsetse fly. Our trade is, of course, at present a small one, but it is steadily increasing. The natives are developing new wants, and if trade were to go from them they would find it very hard to get back to their old condition.

MLANJE POST-OFFICE.

The Protectorate is badly in want of a railway from Chiromo to Blantyre, some 60 miles long only. Such a line would pass through the rich coffee-planting district of Cholo, and could conveniently be extended from Blantyre northwards to the navigable portion of the upper Shire, so connecting the lower with the upper Shire river, and completing a line of steam communication which would reach from Chinde to the north end of Nyasa, a distance of some 700 miles. There would be no great difficulties about the construction of this railway, which might be a light narrow-gauge line, say 2 feet 6 inches.* The capital required would probably not exceed £200,000 as far as Blantyre. The up-keep would not be high, and even at the present date there is an existing incoming freight at the rate of about 3000 tons per annum,

* A survey has already been made.

which now costs, from Chiromo to Blantyre, some £5 per ton. There is an increasing outgoing freight, and passenger traffic both ways. I think it is probable that such a line would pay a dividend from the very commencement if economically worked. In addition to this, there is the certainty that such a line would greatly stimulate trade and all undertakings in B.C.A.

In speaking of the resources of the country, I feel that this question has been so fully dealt with previously by Sir H. H. Johnston, and also by Captain Lugard and others, that there really remains little for me to say.

I have only hitherto spoken of *coffee* as the present staple industry, because that is the product which has proved itself to be a financial success. One so frequently reads of this, that, and the other part of Central Africa, that it is a "mine of agricultural wealth;" that it *could* be made to grow wheat, coffee, tea, or a score of other things; but when one asks what it already *has* done, the answer frequently is, "Nothing." In the Shire highlands, the question of coffee-planting has been *settled* by some fifteen years of steady hard work, without advertisement. Many other things, such as tea, cacao, tobacco, wheat, etc., are being tried. With regard to wheat, it is probable that all the flour required in the country will, before long, be locally grown. Already the settlers and missions in the South Tanganyika districts grow their own wheat and make their own flour. A field of some 10 acres at Blantyre, somewhat carelessly and sparely sown and cultivated, last year produced over fifteen bushels to the acre, at a very low cost. Whether wheat can ever be exported at a profit will depend on railway construction chiefly; but so long as there are other products, such as coffee, which give larger profits, settlers are not likely to turn their attention to wheat. The firm of Buchanan Bros., who have done so much for the development of the Shire highlands, export tobacco of a fair quality, and are of opinion that there is a considerable future for this industry. They have recently imported skilled growers and curers, as well as cigar-makers, from India, and are outlaying a considerable capital in the undertaking.

Rubber exists in fair quantities throughout the country, but has been little collected as yet; and this is an industry which might well be largely increased. In addition to the ordinary vine or creeper from which the usual East African rubber is collected, there are at the north end of Nyasa, in the Nkonde country, great quantities of trees—a description of ficus, I believe—yielding excellent rubber. In the lake regions, however, up to the present, few endeavours have been made to obtain rubber, or any other article for export; ivory having been the main thing sought for. Ivory is now becoming scarce in B.C.A., and the trade will before long die out. What at present comes is brought from the Tanganyika districts.

No review, however brief, of the trade in B.C.A. would be complete without reference to the excellent work which has been done there by Mr. L. M. Fotheringham, who was for some years the manager of the African Lakes Corporation, and whose lamented death took place a few months ago. There has never been a more honest, clear-headed, and enterprising man in the country. He has been the *practical business man*, who has been foremost in all schemes for advance and improvement; and one and all, planters, missionaries, explorers, traders, and the Administration, have much to thank him for.

As yet the Shire highland planters have, practically, all their eggs in one basket; and it will doubtless continue to be so for some time to come, as new settlers naturally go in for what they already know will pay, in preference to unproved things. There are enterprising planters in the country, however, who are trying and experimenting with all such tropical or semi-tropical products as give a prospect of success.

Land can be purchased from European owners, from the Government, or through the Government from natives. Its value in the Shire highlands, in the neighbourhood of Blantyre, has risen considerably during the past year, but is still cheap. In more remote districts land can be purchased for trifling amounts, provided that purchasers will improve their holdings.

It was at first found difficult in B.C.A., in some instances, to instil into natives the idea of individual ownership of land. Although they might have sold clearly defined blocks of unoccupied country to Europeans, they would from time to time encroach upon these, pick out the best bits, and come in and fell the bush preparatory to planting their own crops on it. This gave rise to disputes.

In the Shire highlands now, however, the natives fully understand this question of defined boundaries and private ownership—so much so, that of late several Blantyre natives have purchased blocks of land from the Government, and are opening coffee plantations upon them.

I believe firmly that we may look for great development in this direction. Natives are quick to follow a lead when they see it brings them profit. And although we cannot expect that Africans who have had little intercourse with Europeans will quickly settle down to quiet, regular occupations, it is a different matter in districts like the Shire highlands, where for years past they have watched Europeans at work, and have begun to understand the idea of laying out work for a future large return. I know that many believe the African incapable of this. I thought so myself at one time; but it must be remembered that at Blantyre there is a generation growing up who have known the white man from their earliest youth—who do not look on him as anything new, but as part of their world. Blantyre is a centre from which much good of this description may spread.

I may say a word on the question of the raising of revenues

in Central African colonies or protectorates, by native taxation. It is, of course, essential that the native should contribute to the cost of administration of his own country, and the question is as to what form of taxation is most suitable to the circumstances. In B.C.A. a hut tax has been found to be easily understood by the natives, and to be, all considered, the most satisfactory and easily worked system. In the first instance the tax was collected in *kind*; after a time, however, it was found that in more advanced districts, such as Blantyre and Zomba, the people infinitely preferred to pay in *cash*. The matter was therefore made entirely optional; and the result has been that practically the whole of the Blantyre district, lower Shire district, and large portions of other districts, now pay their taxes in cash. This undoubtedly suits the B.C.A. native better than a tax in kind only, and enables him to realize a better price for his products, sold in his own way, than can be obtained by the Administration when forced to dispose of large quantities of native produce. It has also encouraged him to work for and hoard up money. Quite a number of Blantyre natives now have accounts at the local bank, and, having once grasped the idea that they can purchase future benefits by accumulating present savings, have taken one of the first steps towards permanent civilization. The African is not a fool in such matters; he is able to look after his own interests, and is not so easily imposed on as is sometimes supposed.

NOTES ON ANCIENT AND MEDIÆVAL MAKRAN.*

By Colonel T. H. HOLDICH, C.B., C.I.E., R.E.

One of the latest districts traversed and surveyed by the Indian frontier surveyors is Makran. It is possible that some amongst even good geographers may not be precisely acquainted with the geographical position and extent of this long-forgotten country. Makran extends along the northern shores of the Arabian Sea between Karachi and the Persian Gulf, commencing from the Sonmiani bay on the east, and terminating somewhat indefinitely on the west within the recognized territory of Persia. Makran is a geographical rather than a political territorial designation, and may be called the most southern district of South-Western Baluchistan. The limit of British influence on the one side, and Persian on the other, is defined by a demarcated boundary between the Dasht and Sarbaz rivers; but the western limits of Baluchistan on the Arabian sea-coast are not so definite, the Baluch language being spoken as far west as Cape Jask, where the Persian coast first commences to trend northward towards the gulf. The telegraph station of Jask forms the link between the overland line of the Persian Gulf telegraph system and the submarine cable, which

* Map, p. 452.

commences here, and connects the land line with Bushire and Basra on the Euphrates. Between the eastern borders of Makran and Karachi, there intervene the more or less open plains of the Lus Bela district. Lus Bela is already well known to many British residents in Western India. Lately it has been associated in the minds of many with the death of Sir Robert Sandeman. His last resting-place is at Lus Bela, and the garden which surrounds his grave is the brightest spot in a land which is much wanting in the charms of landscape.

Makran does not extend far inland. Its width is from about 80 to 100 miles, including the long, straight valley of Kej, which, in mediæval geography, has its name associated with that of Makran, under the compound designation Kej-Makran. The name Makran I believe to be derived from two Persian words, viz. Mahi (fish), and Khuran (to eat). So simple a derivation is, I am aware, a stumbling-block to some etymologists, but it is too appropriate to be parted with without a struggle. The whole population of the Makran coast lives on fish to an extent that may seem almost incredible. Not only do men, women, and children eat fish, but fish enters largely into the food of dogs, cats, camels, and cattle. By fish the people live. Fish are dried, salted, and exported to the west coast of India, where salt duties prevent a local industry, and to China, whilst large quantities are sent inland. The coast-line for miles is soaked in an atmosphere of dead fish, and the very huts of fishermen are occasionally built up with whales' bones. The Makrains of the coast are the veritable Ichthyophagi of the Greeks, and the stories told of their fish-eating propensities by Arrian are true of them still.

The ethnographical conditions of southern Baluchistan are about as complicated as any in Asia. The original stock of the country underlying all else is Tajak or Persian, and it has been so, at any rate, since the days of Darius. The Baluch language is an archaic form of Persian, said to be the language that the poet Firdusi talked. Traces of ancient forms of fire-worship are not wanting, especially along the coast, where the classical Parsirees or Parsidai (possibly the ancient representative of the modern Parsi) have left indications of their former existence at Pasni and, more conspicuously, in the neighbourhood of Gwattar bay. Off the coast of Makran is an island, once sacred to the sun, and still surrounded with an atmosphere of myth and fable, called Hashtola, or sometimes Haftalu. It is also locally known as Serandip, which orientalists will recognize as an old name for Ceylon. In this island of Hashtola, or Astola, we can recognize the Asthara of Ptolemy and the Nusala of Arrian. Here dwelt the Nereid who turned men into fish, and it was off this island that Nearkos lost one of his galleys in a storm. More recently it has served as a base for piratic operations on the part of Meds and Karaks in the Arabian Sea. A yet older cult than that of fire-worship is also to be traced through this part of Southern

Baluchistan, if we are to accept Professor Rawlinson's derivation of the name Baluchistan from Belus, or Baal; but this derivation, I am aware, is at least open to question. It can hardly be doubted, however, that Baal-worshippers passed through Makran, if they did not actually occupy the whole country in those days, when the pre-Semitic Dravidian races of Mesopotamia were gradually displaced by the Semite in the plains of Chaldæa. It seems most probable that these Dravidian races which now occupy the jungles and mountains of the Central Provinces of India, and who left representatives of their mighty family in the hills of Makran as they passed, must have migrated from the neighbourhood of Babylon to India. They have left their silent records in the shape of curious little stone-built structures on the Makran hillsides, which occur in groups or towns, and give the name Damba Koh to the hills they occupy.

These curious ruins are wrapped in the same traditions as may be recognized again amongst modern Turanian tribes in Central and Southern India to this day. Here, too, Colonel Mockler (who was long resident on the Makran coast) discovered traces of that peculiar form of sepulture which, so far as I know, has hitherto been found only in Chaldæa, *i.e.* the burial of the dead in earthenware pots. This, indeed, appears to be the oldest form of sepulture known in Mesopotamia. Dravidian races still exist in Makran under the name Brahui, or Barohi (*i.e.* mountaineer), and they occupy nearly all the hilly districts of the eastern part of the country. They appear to be exactly where they were when they met Alexander's army in its retreat from India, and can be recognized as the Sakæ, Sagitti, Parkanoi of classics, all of which names are to be found either as tribal or local designations at the present time. There was possibly a period in prehistoric days when all Makran was peopled with this Turanian or Dravidian race. We find mention made by Ptolemy of a people called the Rhamnai who dwelt on the extreme east near the banks of the Purali, and who planted their capital at a place called Rhambakia. Rhambakia is mentioned by Alexander's historian as the capital of a people called the Oritæ. The Rhamnai are said to have wandered south-east, and in Ptolemy's time were settled in the Vindhya mountains; but who were the Oritæ? I thought, when I first visited the Bela district, that they might possibly have been the modern Rajput occupants; but the Rajput immigration from the east is comparatively recent, and must have occurred since Lus Bela was a Budhist kingdom, which we know to have been about the time of the Mahomedan conquest of Sind; so that it is probable that the Oritæ were Dravidians (they are described as non-Indian by Arrian), cognate to the present Brahui tribes, and that remnants of the tribe are still to be found further west. Thus we can as clearly trace a Dravidian phase in the ethnographical history of Makran as we can in India, and, as in India, it has lasted in fragments until now. So intermixed and so extensive are the various

groupings of this ethnographical history that it is impossible to separate them clearly and distinctly. Earliest of all may have been that apparently aboriginal occupant of the coast whom Nearkos describes in his graphic account of the stirring little fight which took place near the mouth of the Hingol river (then called Toméros), when the Greeks leapt into the sea to meet their adversaries. The savages whom they encountered are described as fish-eaters, clothed in fish-skins—a hairy race, with long nails with which they used to divide their fish; and they used for weapons wooden pikes hardened in the fire. Such a description might appear almost apocryphal but that a specimen of the race has been caught in the forests of Central India within living memory, and he did not differ largely from Arrian's description of the barbarians of Makran.

Next, perhaps, amongst the rolling centuries of that prehistoric time, we might have found that race known in Southern India in the present day as the Pandomanagai, or race of little men, dwarfs, or pigmies, frequently alluded to by classical writers in other parts of India, traces of whom are found all along the western coast of India, and are not altogether wanting, even if they are faint, in the cave-dwellings of Makran. Then came successive waves of Dravidian, followed by Aryan, immigration, and we begin to feel the solid ground of history. Herodotus describes Makran, including it in one of the Persian satrapies, and he enumerates the tribes of Gadrosia (the ancient Greek name for Makran) under names which are mostly recognizable still. The only people, indeed, distinctly classed by Herodotus whom we fail to find are those whom he calls Asiatic Ethiopians, those descendants of Kush whom some authorities still believe to have left evidence of their existence in the nomenclature of the country. The name Kej, and synonymous terms variously written by Arab geographers, are referred back to the eponymous Kush, and the association of the names Kej-Makran, which has been common under various forms through all ages, has been accepted as pointing to the fact that Ethiopian tribes once occupied Southern Baluchistan. Woolly-headed negroes, slaves and descendants of slaves imported from Africa, are common enough, but no Kushites, so far as I know; and I think it possible that Herodotus referred to the Dravidian inhabitants of the country under this term. I am more inclined to accept the prefix Kej, or, as it is more generally written by the Arabs, Kiz, as a generic term referring to comparatively open and flat country—such as the Kej valley in Makran, or the more open plain of Gandava, generally known as Kach-Gandava. The Kiz Kaián, so frequently mentioned in mediæval geography, and never hitherto located by orientalists, were the plains north-west of Makran stretching towards the frontier of Kirman. The word Kach, Kachi, or Katz is frequently met with in Western India, and always denotes a flat country, even if it be only a flat space at the foot of precipitous mountains.

Very much indeed still remains to be investigated about those early prehistoric waves of migration that passed through Makran to India. Fergusson has said that "across the Indus nation after nation have poured their myriads into the coveted domain of India, but no reflex wave has ever mixed her people with those beyond her boundaries." Exceptions to this rule are to be found in Makran. These Rajput races which now dominate Lus Bela, and have established their authority in the Kej valley of Makran, certainly migrated westwards; and there are also the Meds, those fish-eating villagers of the coast, once the most dreaded pirates of the Eastern seas, who have undoubtedly held a dominant position in the northern valley of the Indus, and who have been gradually pushed from the north-west to the Indus delta, and thence thrust over the Indus to Makran. If Arrian is correct in crediting the Medes as well as the Assyrians with the conquest of Northern India, we may have the remnants of those conquerors in the Med fishermen of the Arabian sea-coast.

We must, however, turn from prehistoric phases of Makran ethnography to those later arrivals whom we find implanted amongst the old Persian Dravidian stock at the present day. Throughout the hill districts of the Sind border, extending westwards through Makran, we find scattered a great confederation of powerful tribes known as Rind. The Rind, whether he hails from a mountain glen near Quetta, or from the extreme west of Makran, always poses as the true Baluch. The Rinds are the aristocracy of Baluchistan, even where the Rajput dominates; and if you ask a member of any tribe of that widespread confederacy from whence his people originally came, he invariably replies from Haleb, or Aleppo. The Rind is most probably the modern representative of that Arab irruption into India which accompanied or succeeded its invasion by Mahomed Kasim in the year 712 of our era. Undeterred by the traditional discomfiture of Semiramis, queen of the Assyrians, or of Cyrus, in the deserts of Makran (traditions which, indeed, served but to inflame the ambition of Alexander, who fared but little better than his illustrious predecessors), Hajjaj, the governor of Irak, under the Kalif Walid I., projected three simultaneous expeditions into Asia for the advancement of the true faith. One was directed towards Samarkand, one against the King of Kabul, and the third was to operate directly on India through the heart of Makran. The Makran field force was organized in the first instance for the purpose of punishing certain Karak and Med pirates who had plundered a valuable convoy sent by the ruler of Ceylon to Hajjaj and to the Kalif. These Karaks probably gave their names to the Krokala of Nearkos, and the Karachi of to-day, and have disappeared. The Meds, as I have already explained, still exist. The expedition, which was placed under the command of an enterprising young general aged seventeen, named Mahomed Kasim, not only swept through Makran

easily and successfully, but ended by establishing Mahomedan supremacy in the Indus valley, and originated a form of government which, under various phases, lasted till Mahmud of Ghazni put an end to a degenerated form of it by ousting the Karmatian rulers of Multan in 1005. The original force which invaded Sind under Mahomed Kasim, and which was drawn chiefly from Syria and Irak, consisted of 6000 camel-riders and 3000 infantry. In Makran the Arab governor (it is important to note that there was an Arab governor of Makran before that country became the high-road to India) added further reinforcements, and there was also a naval squadron, which conveyed catapults and ammunition by sea to the Indus valley port of Debal. It was with this small force that one of the most surprising invasions of India ever attempted was successfully carried through Makran—a country hitherto deemed impracticable, and associated in previous history with nothing but tales of disaster. Ere long, however, we find that Mahomed Kasim had both the piratical Meds, and the hardly less tractable Jats (a Skythic people still existing in the Indus valley, not unconnected with the Gitanos, or gypsies) in his train, and the news of his successes carried to Damascus brought crowds of Arab adventurers to follow his fortunes. When he left Multan for the north, he is said to have had 50,000 men under his command. His subsequent career and tragic end are all matters of history. The points chiefly to note in this remarkable invasion are that the Arab soldiers first engaged were chiefly recruited from Syria; that, contrary to their usual custom, they brought none of their women with them; and that none of them probably ever returned to their country again. Elliott tells us of the message sent them by the savage Kalif Sulaiman, "Sow and sweat, for none of you will ever see Syria again." What, then, became of all these first Arab conquerors of Western India? Is there any trace of them now? The reply to this question seems to me to be that their descendants exist in that formidable band of frontier tribes known as Rind, every man of whom says his ancestors came from Syria, whilst he bears about him the unmistakable stamp of Semitic origin. Put a Rind of Western Makran and a Bedu of Eastern Arabia together, and they might well be brothers so far as personal appearance goes. They must have taken Persian-speaking wives of the stock of Makran and Baluchistan, and their children, speaking their mother-tongue, probably lost all knowledge of their fathers' language in the course of a few generations. There are many such instances of the rapid disappearance of a language in the East. These people, the Rinds of to-day, are the latest arrivals in this strange meeting-place of the nations, if we except the Rajput irruption of Lumri and Gichki tribes from the East, which is indeed almost modern history. For three centuries, then, whilst a people of Arab descent ruled in Sind, there existed through Makran one of the great highways of the world, a link

between West and East such as has never existed elsewhere on the Indian border, save perhaps through the valley of the Kabul river and its affluents. Along this highway flowed the greater part of the mighty trade of India, a trade which has never failed to give commercial predominance to that country which held the golden key to it, whether that key has been in the hands of Arab, Turk, Venetian, Portuguese, or Englishman. And though there are traces of a rapid decline in the mediæval prosperity of Makran after the commencement of the eleventh century, yet its comparative remoteness in geographical position saved it subsequently from the ruthless destruction inflicted by Turk and Tartar in more accessible regions, and left to it cities worth despoiling even in the days of Portuguese supremacy.

It is only lately that Makran has lapsed again into a mere geographical expression. Ten years ago our maps told us nothing about it. It might have been, and was for all practical purposes, as unexplored and unknown as the forests of Africa. Now, however, we have found that Makran is a country of great topographical interest as well as of stirring history. We can not only find the peoples written of by Herodotus, but we can trace the slow course of the galleys and transports of Nearchus along the coast, noting meanwhile the curious changes that time has wrought in the coast configuration. We can point out the strange route followed by Alexander, and wonder what manner of madness could have induced him to select such a route. We can find the ports at which Arab ships, the dhows and buglas which were the first of all East Indiamen (if we except the Chinese junk), used to touch and collect their store of myrrh, bdellium, and spikenard, in exchange for those many and strange kinds of merchandise which you may find enumerated in the Periplus of the Erythræan Sea; some relics of which, indeed (such as the γαλος ἀρθη, the Egyptian glass), you may dig up on almost any site between Karachi and Babylon. And when we come to the days of Arab ascendency, when Arab merchants settled in the country; when good roads with well-marked stages were established; when, fortunately for geography, certain western globe-trotters following, *longo intervallo*, the example of the Chinese pilgrims—men such as Ibn Haukal of Baghdad, or Istakhri of Persepolis, first set to work to reduce geographical discovery to systematic compilation, we can take their books and maps in our hands, and verify their statements as we read. It is true that they copied a good deal from each other, and that their manner of writing geographical names was obscure, and leaves a good deal to be desired—a fault, by the way, from which the maps of to-day are not entirely free—yet they are on the whole as much more accurate than the early Greek geographers as the area of their observations is more restricted. We may say that Makran and Sind are perhaps more fully treated of by Arab geographers than any other portion of the globe by the geographers who preceded them; and as

their details are more perfect, so for the most part is the identification of those details rendered comparatively easy by the nature of the country and its physical characteristics. With the exception of the coast-line, the topography of Makran to-day is the topography of Makran in Alexandrian days. This is very different indeed from the uncertain character of the Indus valley mediæval geography. There the extraordinary hydrographical changes that have taken place; the shifting of the great river itself from east to west, dependent on certain recognized natural laws; the drying up and total disappearance of ancient channels and river-beds; the formation of a delta, and the ever-varying alterations in the coast-line, due possibly to monsoon influences, leave large tracts almost unrecognizable as described in mediæval literature. Makran is, for the most part, a country of hills. Its valleys are narrow and sharply defined; its mountains only passable at certain well-known points, which must have been as definite before the Christian era as they are to-day; and it is consequently comparatively easy to follow up a clue to any main route passing through that country.

Along our western frontier of India, south of Jacobabad, the general direction of the Indus channel is not a bad index to the general trend of the mountain ranges west of it. They lie packed in parallel ridges, rising in altitude from the plains of the Indus to the plateau of Baluchistan, and the eastern section of the present system abuts on the sea between Karachi and Sonmiani bay. Westward of Sonmiani, it is the coast-line which roughly indicates the general trend of the remaining or western half of the system. The same curiously close parallelism of narrow ranges running east and west is traceable past the western limits of Makran into the Bashkurd country beyond. Here it becomes more irregular. The westward curve of this inner band of ridges, from a direction nearly north and south parallel to the Indus, to one nearly east and west parallel to the coast of Makran, leaves a triangular space of comparatively open country between itself and that eastern section which abuts on the sea between Karachi and Sonmiani. Down this open space descends the Purali river (the ancient Arabius), which is itself gradually shifting westward, and which finds its way into the sea through a large tract of low-lying country which was a shallow sea at no very distant date. Hereabouts was the land from which bdellium was exported; and here, on the right bank of the Purali, was the ancient Dravidian capital of Rhambakia.

It follows, from this configuration, that Makran is a country full of long narrow valleys running east and west, the longest and most important being the valley of Kej. The main drainage of the country reaches the sea by a series of main channels running south, which, inasmuch as they are driven almost at right angles across the general run of the watersheds, necessarily pass through a series of gorges of most magnificent proportions, which are far more impressive as spectacles

than they are convenient for practical road-making. Makran is, in fact, very much easier to traverse from east to west than it is from north to south. At certain points along the coast the mountain system touches the sea, and the right of way becomes blocked by a magnificent mass of impassable rock-bound barrier, which terminates in huge square-headed bluffs to seaward. Such is Ras Malan, the ancient Malana, which effectually barred the march of the Greek army in its progress along the coast westward.

I have, perhaps, said enough to indicate that the old highways through Makran, however much they may have assisted trade and traffic between east and west, could only have been confined to very narrow limits indeed. It is, in fact, almost a one-road country. Given the key, then, to open the gates of such channels of communication as exist, there is no difficulty in following them up, and the identification of successive stages becomes merely a matter of local search. We know where the old Arab cities *must* have been, and we have but to look about to find their ruins. The best key, perhaps, to this mediæval system is to be found in a map given by the Baghdad traveller, Ibn Haukal, who wrote his account of Makran early in the tenth century, and though this map leaves much to be desired in clearness and accuracy, it is quite sufficient to give us the clue we require at first starting. In the written geographical accounts of the country, we labour under the disadvantage of possessing no comparative standard of distance. The Arab of mediæval days described the distance to be traversed between one point and another much as the Bedouin describes it now. It is so many days' journey. Occasionally, indeed, we find a compiler of more than usual precision modifying his description of a stage as a long day's journey, or a short one. But such instances are rare, and a day's journey appears to be literally just so much as could conveniently be included in a day's work, with due regard to the character of the route traversed. Across an open desert a day's journey may be as much as 80 miles. Between the cities of a well-populated district it may be much less. Taking an average from all known distances, it is between 40 and 50 miles. Nor is it always explained whether the day's journey is by land or sea, the unit "a day's journey" being the distance traversed independent of the means of transit.

In Ibn Haukal's map, although we have very little indication of comparative distance, we have a rough idea of bearings, and the invaluable datum of a fixed starting-point that can be identified beyond doubt. The great Arab port on the Makran coast, sometimes even called the capital of Makran, was Tiz; and Tiz is a well-known coast village to this day. About 100 miles west of the port of Gwadur there is a convenient and sheltered harbour for coast shipping, and on the shores of it a telegraph station of the Persian Gulf line, called Charbar. The telegraph station occupies the extremity of the eastern horn of the

bay, and is separated inland by some few miles of sandy waste from a low band of coarse conglomerate hills, which conceal amongst them a narrow valley, containing all that is left of the ancient port of Tiz. If you take a boat from Charbar point, and, coasting up the bay, land at the mouth of this valley, you will first of all be confronted by a picturesque little Persian fort perched on the rocks on either hand, and absolutely blocking the entrance to the valley. This fort was built, or at least renewed, in the days of General Sir F. Goldsmid's Sistan mission, to emphasize the fact that the Persian Government claimed that valley for its own. About a mile above the fort there exists a squalid little fishing village, the inhabitants of which spend their spare moments (and they have many of them) in making those palm mats which enter so largely into the house architecture of the coast villages, as they sit beneath the shade of one or two remarkably fine "banian" trees. The valley is narrow and close, and the ruins of Tiz, extending on both sides the village, are packed close together in enormous heaps of *débris*, so covered with broken pottery as to suggest the idea that the inhabitants of old Tiz must have once devoted themselves entirely to the production of ceramic art ware. Every heavy shower of rain washes out fragments of new curiosities in glass and china. Here may be found large quantities of an antique form of glass, the secret of the manufacture of which has (according to Venetian experts) long passed away, only to be lately rediscovered. It takes the shape of bangles chiefly, and in this form may be dug up in the sites of almost any recognized site of ancient coast towns along the Makran and Persian coasts. It is undoubtedly of Egyptian origin, and was brought to the coast in Arab ships. Here also is to be found much of a special class of pottery, of very fine texture, and usually finished with a light sage-green glaze, which appears to me to be peculiarly Arabic, but of which I have yet to learn the full history. It is well known in Afghanistan, where it is said to possess the property of detecting poison by cracking under it, but even there it is no modern importation. Doubtless it is known to experts, but I have not yet discovered a name for it. The rocky cliffs on either side the valley are honeycombed with Mahomedan tombs, and the face of every flat-spaced eminence is scarred with them. A hundred generations of Moslems are buried there. The rocky declivities which hedge in this remarkable site may give some clue to the yet more ancient name of Talara which this place once bore. Talar in Baluchi bears the signification of a rocky band of cliffs or hills.

The obvious reason why the port of Tiz was chosen for the point of debarkation for India is that, in addition to the general convenience of the harbour, the monsoon winds do not affect the coast so far west. At seasons when the Indus delta and the port of Debal were rendered unapproachable, Tiz was an easy port to gain. There must have been a considerable local trade, too, between the coast and the highly

cultivated, if restricted, valleys of Northern Makran, and it is more than probable that Tiz was the port for the commerce of Sistan. Sistan (the ancient Drangia) and the lower Helmund valley were, in mediæval days, most richly cultivated districts, with an enormous area of irrigated land, and boasting the possession of cities the magnitude of which we can but faintly estimate from the extent of their widespread ruins. From Rudbar on the Helmund, westward, the valley is but a vista of dead cities for mile upon mile. In Sistan we are but beginning to trace their records. I know of the graveyard of one dead city at least, where 8 or 10 straight miles of ruins may be counted, and where brick-built two or three storeyed houses still stand in silent witness to the strength of Arab architecture. Sistan was the granary of Asia once; it might be so again, were the magnificent irrigation schemes of the past revived. From Sistan a very large export trade (now represented by some few dozen Kafilas a year) must once have poured southwards, and Tiz was in all probability the coast outlet for it.

From Tiz to Kiz (or Kej, which is reckoned as the first big city on the road to India in mediæval geography) was, according to Istakhri and Idrisi, a five days' journey. Kiz is doubtless synonymous with Kej, but the long straight valley of that name which leads eastwards towards India has no town now which exactly corresponds to the name of the valley. The distance between Tiz and the Kej district is from 160 to 170 miles. No actual ruined site can be pointed out as yet marking the position of Kiz, or (as Idrisi writes it) Kirusi, but it must have been in the close neighbourhood of Kalatak, where, indeed, there is ample room for further close investigation amongst surrounding ruins. About the city, we may note from Idrisi that it was nearly as large as Multan, and was the largest city in Makran. "Palm trees are plentiful, and there is a large trade," says our author, who adds that it is two long days' journey west of the city of Firabuz. From all the varied forms which Arab geographical names can assume owing to omission of diacritical marks in writing, this place, Firabuz, has perhaps suffered most. The most correct reading of it would probably be Kanazbun, and this is the form adopted by Elliott, who conjectures that Kanazbun was situated near the modern Panjgur. From Kej to Panjgur is not less than 110 miles, a very long two days' journey. Yet Istakhri supports Idrisi (if, indeed, he is not the original author of the statement), that it is two days' journey from Kiz to Kanazbun. This would lead one to place Kanazbun elsewhere than in the Panjgur district, more especially as that district lies well to the north of the direct road to India, were it not for local evidence that the fertile and flourishing Panjgur valley must certainly be included somehow in the mediæval geographical system, and that the conditions of Khafila traffic in mediæval times were such as to preclude the possibility of the more direct route being utilized. To explain this fully would demand a full explanation also of the physical geography of

Eastern Makran, which can hardly be included in this paper. I have no doubt whatever that Sir H. Elliott is right in his conjecture, and that amongst the many relics of ancient civilization which are to be found in Panjgur is the site of Kanazbun. Kanazbun was in existence long before the Arab invasion of Sind. The modern fort of Kudabandan probably represents the site of that more ancient fort which was built by the usurper Chach of Sind, when he marched through Makran to fix its further boundaries about the beginning of the Mahomedan era. Kanazbun was a very large city indeed. "It is a town," says Idrisi, "of which the inhabitants are rich. They carry on a great trade. They are men of their word, enemies of fraud, and they are generous and hospitable." Panjgur, I may add, is a delightfully green spot amongst many other green spots in Makran. It is not long ago that we had a small force cantoned there to preserve law and order in that lawless land. There appeared to be but one verdict on the part of the officers who lived there, and that verdict was all in its favour. In this particular, Panjgur is probably unique amongst frontier outposts.

The next important city on the road to Sind was Armail, Armabel, or Karabel, now without doubt, Lus Bela. From Kudabandan to Lus Bela is from 170 to 180 miles, and there is considerable variety of opinion as to the number of days that were to be occupied in traversing the distance. Istakhri says that from Kiz to Armail is six days' journey. Deduct the two from Kiz to Kanazbun, and the distance between Kanazbun and Armail is four days. Ibn Haukal makes it fourteen marches from Kanazbun to the port of Debal, and as he reckons Armail to be six from Debal on the Kanazbun road, we get a second estimate of eight days' journey. Idrisi says that from Manhabari to Firabuz is six marches, and we know otherwise that from Manhabari to Armail was four, so the third estimate gives us two days' journey. Istakhri's estimate is more in accordance with the average that we find elsewhere, and he is the probable author of the original statements. But doubtless the number of days occupied varied with the season and the amount of supplies procurable. There were villages *en route*, and many halting-places. The 'Ashkalu l' Bilad' of Ibn Haukal says, "Villages of Dahuk and Kalwan are contiguous, and are between Labi and Armail;" from which Elliott conjectures that Labi was synonymous with Kiz. Idrisi states that "between Kiz and Armail two districts touch each other, Rahun and Kalwan." I should be inclined to suggest that the districts of Dashtak and Kolwah are those referred to. They are contiguous, and they may be said to be between Kiz and Armail, though it would be more exact to place them between Kanazbun and Armail. Kolwah is a well-cultivated district lying to the south of the river, which in its upper course is known as the Lob. I should conjecture that this may be the Labi referred to by Ibn Haukal.

The city of Armail, Armabel (sometimes Karabel), or Lus Bela, is

of such historic interest that it requires far more notice than is possible within reasonable limits for a paper of this description. From the very earliest days of historical record, Armail, by right of its position commanding the high-road to India, must have been of great importance. Lus Bela is but the modern name derived from the influx of the Lus or Lumri tribe of Rajputs. It is at present but an insignificant little town, picturesquely perched on the banks of the Puráli river, but in its immediate neighbourhood is a veritable *embarras de richesse* in ancient sites. Eleven miles north-west of Lus Bela, at Gondakahar, are the ruins of a very ancient city, which at first sight appear to carry us back to the pre-Mahomedan era of Arab occupation, when the country was peopled by Arabii, and the Arab flag was paramount on the high seas. Not far from them are the caves of Gondrani, about which there is no room for conjecture, for they are clearly Budhist, as can be told from their construction. We know from the Chachnama of Sind that in the middle of the eighth century the province of Lus Bela was part of a Budhist kingdom, which extended from Armabel to the modern province of Gandava, in Sind. The great trade mart for the Budhists on the frontier was a place called Kandabel, which Elliott identifies with Gandava, the capital of the province of Kach Gandava. It is, however, associated in the Chachnama with Kandahar, the expression "Kandabel, that is, Kandahar" being used, an expression which Elliott condemns for its inaccuracy, as he recognizes but the one Kandahar, which is in Afghanistan. It happens that there is a Kandahar, or Gandahar, in Kach Gandava, and there are ruins enough in the neighbourhood to justify the suspicion that this was after all the original Kandabel rather than the modern town of Gandava. The capital of this ancient Budha—or Budhiya—kingdom I believe to have been Armabel rather than Kandabel, it being at Armabel that Chach found a Budhist priest reigning in the year 2 A.H., when he passed through. The curious association of names, and the undoubted Budhist character of the Gondrani caves, would lead one to assign a Budhist origin also to the neighbouring ruins of Gondakahar, or Gandakahar, only that direct evidence from the ruins themselves is at present wanting to confirm this conjecture. They require far closer investigation than has been found possible in the course of ordinary survey operations. The country lying between Lus Bela and Kach Gandava is occupied at present by a most troublesome section of the Dravidian Brahuis, who call themselves Mingals, or Mongols, and who possibly may be a Mongolian graft on the Dravidian stock. They may prove to be modern representatives of the old Budhist population of this land, but their objection to political control has hitherto debarred us from even exploring their country, although it is immediately on our own borders. About 8 miles north of Lus Bela are the ruins of a comparatively recent Arab settlement, but they do not appear to be important. It is probable that certain other ruins, about 1½ mile east of

the town, called Karia Pir, represent the latest mediæval site, the site which was adopted after the destruction of the older city by Mahomed Kasim on his way to invade Sind. Karia Pir is full of Arabic coins and pottery. So many invasions of India have been planned with varied success by the Kalifs of Baghdad since the first invasion in the days of Omar I. in 644 A.D., till the time of the final occupation of Sind in the time of the sixth Kalif Walid, about 712 A.D., that there is no difficulty in accounting for the varied sites and fortunes of any city occupying so important a strategical position as Bela.

From Armail we have a two days' march assigned by Istakhri and Idrisi as the distance to the town of Kambali, or Yusli, towards India. These two places have, in consequence of their similarity in position, become much confused, and it has been assumed by some scholars that they are identical. But they are clearly separated in Ibn Haukal's map, and it is, in fact, the question only of which of two routes towards India is selected that will decide which of the two cities will be found on the road. There is (and always must have been) a choice of routes to the ancient port of Debal after passing the city of Armail. That route which led through Yusli in all probability passed by the modern site of Uthal. Close to this village the unmistakable ruins of a considerable Arab town have been found, and I have no hesitation in identifying them as those of Yusli. About Kambali, too, there can be very little doubt. There are certain well-known ruins called Khairokot not far to the west of the village of Liari. We know from mediæval description that Kambali was close to the sea, and the sea shaped its coast-line in mediæval days so as nearly to touch the site called Khairokot. Even now, under certain conditions of tide, it is possible to reach Liari in a coast fishing-boat, although the process of land formation at the head of the Sonmiani bay is proceeding so fast that, on the other hand, it is occasionally impossible even to reach the fishing village of Sonmiani itself. The ruins of Khairokot are so extensive, and yield such large evidences of Arab occupation, that a place must certainly be found for them in the mediæval system. Kambali appears to be the only possible solution to the problem, although it is somewhat off the direct road between Armail and Debal.

From either of these towns we have a six days' journey to Debal, passing two other cities *en route*, viz. Manabari and the "small but populous town of Khur."

The Manhanari of Istakhri, Manbatara of Ibn Haukal, or Manabari of Idrisi, again confronts us with the oft-repeated difficulty of two places with similar names, there being no one individual site which will answer all the descriptions given. General Haig has shown that there was in all probability a Manjabari on the old channel of the Indus, nearly opposite the famous city of Mansura, some 40 miles north-east of the modern Hydrabad, which will answer certain points of Arabic

description; but he shows conclusively that this could not be the Manhabari of Ibn Haukal and Idrisi, which was two days' journey from Debal on the road to Armail. As we have now decided what direction that road must have taken, after accepting General Haig's position for Debal, and bearing in mind Idrisi's description of the town as "built in a hollow," with fountains, springs, and gardens around it, there seems to me but little doubt that the site of the ancient Manhabari is to be found on that resort of all Karachi holiday-makers called Mugger Pir. Here the sacred alligators are kept, and hence the recognized name; but the real name of the place, divested of its vulgar attributes, is Manga, or Manja Pir. The affix Pir is common throughout the Bela district, and is a modern introduction. The position of Mugger Pir, with its encircling walls of hills, its adjacent hot springs and gardens, so rare as to be almost unique in this part of the country, its convenient position with respect to the coast, and, above all, its interesting architectural remains, mark it unmistakably as that Manhabari of Idrisi which was two days' march from Debal.

Whether Manhabari can be identified with that ancient capital of Indo-Skythna spoken of by Ptolemy and the author of the 'Periplus' as Minagar, or Binagar, may be open to question, though there are a good many points about it which appear to meet the description given by more ancient geographers. The question is too large to enter on now, but there is certainly reason to think that such identification may be found possible. The small but populous town of Khur has left some apparent records of its existence near the Malir waterworks of Karachi, where there is a very fine group of Arab tombs in a good state of preservation. There is a village called Khair marked on the map not far from this position, and the actual site of the old town cannot be far from it, although I have not had the opportunity of identifying it. It is directly on the road connecting Debal with Manhabari. With Manhabari and Khur our tale of buried cities closes in this direction. We have but to add that General Haig identifies Debal with a ruin-covered site 20 miles south-west of Thatta, and about 45 miles east-south-east of Karachi.

All these ancient cities eastwards from Makran are associated with one very interesting feature. Somewhat apart from the deserted and hardly recognizable ruins of the cities are groups of remarkable tombs, constructed of stone, and carved with a most minute beauty of design, which is so well preserved as to appear almost fresh from the hands of the sculptor. These tombs are locally known as "Khalmati," or, as I believe it should be written, "Karmati."

Invariably placed on rising ground, with a fair command of the surrounding landscape, they are the most conspicuous witnesses yet remaining of the nature of the Saracenic style of decorative art which must have beautified those early cities. The cities themselves have long

since passed away, but these stone records of dead citizens still remain to illustrate, if even with a feeble light, one of the darkest epochs in the history of Indian architecture. If, as I fully believe, they are really Karmati (*i.e.* Karmatian), they are witnesses also to the strength of perhaps the most remarkable of all those sects of schismatics which sprung up in the early centuries of Islam, and which linked together East and West with a tie of religious sympathy and crime which is almost unparalleled in the history of the world. There were many Moslem heretical sects before the days of the Karmatians; but "the people of the veil," as the Karmatians were called, were almost certainly the Eastern representatives of those Assassins of Syria who obeyed the behests of the old man of the mountain. Karmatians and Assassins appear to have been held together by certain ties of mystic faith (or it may well have been the want of it), and by the practice of secret rites so shrouded and hidden in a veil of mystery as to have rendered them for ever a most fascinating subject of inquiry to the historical student. Karmatian ascendency in Multan ended with the advent of Mahmud of Gharni in 1005; but there have been Karmatian rulers in Sind since those days, and there is a people in Sind who still bear their name. But we are wandering far from the borders of Makran, and must turn back for a space to those western regions which connected our first seaport Tiz with Persia.

We have so far only dealt with that route to India which combined a coasting voyage in Arab ships with an overland journey, which was obviously performed on a camel, or the day's stages could never have been accomplished. But the number of cities in Western Makran and Kirman which still exist under their mediæval names, which are thickly surrounded with evidences of their former wealth and greatness, certifies to a former trade through Persia to India which could have been nowise inferior to that from the shores of Arabia or Egypt. Indeed, the overland route to India through Persia and Makran was probably one of the best trodden trade routes that the world has ever seen. It is almost unnecessary to enumerate such names as Darak, Bih, Band, Kasrkand, Asfaka, and Fahalfahra (all of which are to be found in Ibn Haukal's map), and to point out that they are represented in modern geography by Dizak, Geh, Binth, Kasrkand, Asfaka, and Bahu Kalat. Degenerated and narrowed as they now are, there are still evidences written large enough in surrounding ruins to satisfy the investigator of the reality and greatness of their past; whilst the present nature of the routes which connect them by river and mountain is enough to prove that they never could have been of small account in the Arab geographical system. One city in this part of Makran is, I confess, something of a riddle to me still. Rasak is ever spoken of by Arab geographers as the city of schismatics. There is, indeed, a Rasak on the Sarbaz river road to Bampur, which might be strained to fit the

position assigned it in Arab geography; but it is now a small and insignificant village, and apparently could never have been otherwise. There is no room for a city of such world-wide fame as the ancient headquarters of heresy must have been—a city which formed a connecting-link between the heretics of Persia and those of Sind.

Istakhri says that Rasak is two days' journey from Fahalfahra (which there is good reason for believing to be Bahu Kalat), but Idrisi makes it a three days' journey from that place, and three days from Darak, so that it should be about halfway between them. Now, Darak can hardly be other than Dizak, which is described by the same authority as three days' journey from Firabuz (*i.e.* Kanazbun). It is also said to have been a populous town, and south-west of it was "a high mountain called the Mountain of Salt." South-west of Dizak are the highest mountains in Makran, called the Bampusht Koh, and there is enough salt in the neighbourhood to justify the geographer's description. It may also be said to be three days' journey from Kanazbun. Somewhere about halfway between Dizak and Bahu Kalat is the important town of Sarbaz, and from a description of contiguous ruins which has been given by Mr. E. A. Wainwright, of the Survey Department (to whom I am indebted for most of the Makran identifications), I am inclined to place the ancient Rasak at Sarbaz rather than in the position which the modern name would apply to it. It is rather significant that Ibn Haukal omits Rasak altogether from his map. Its importance may be estimated from Idrisi's description of it taken from the translation given by Elliott in the first volume of his history of India: "The inhabitants of Rasak are schismatics. Their territory is divided into two districts, one called Al Kharij, and the other Kir" (or Kiz) "Kaián. Sugar-cane is much cultivated, and a considerable trade is carried on in a sweetmeat called 'faniz,' which is made here. . . . The territory of Maskan joins that of Kirman." Maskan is probably represented by Mashkel at the present day, Mashkel being the best date-growing district in Southern Baluchistan. It adjoins Kirman, and produces dates of such excellent quality that they compare favourably with the best products of the Euphrates. Idrisi's description of this part of Western Makran continues thus: "The inhabitants have a great reputation for courage. They have date-trees, camels, cereals, and the fruit of cold countries." He then gives a table of distances, from which we can roughly estimate the meaning of "a day's journey." After stating that Fahalfahra, Asfaka, Band, and Kasrkand are dependencies of Makran which resemble each other in point of size and extent of their trade, he goes on to say, "Fahalfahra to Rasak two days." (Istakhri makes it three days, the distance from Bahu Kalat to Sarbaz being about 80 miles.) "From Fahalfahra to Asfaka two days." (This is almost impossible, the distance being about 160 miles, and the route passing through several large towns.) "From Asfaka to Band one day

towards the west." (This is about 45 miles south-west rather than west.) "From Asfaka to Darak three days." (150 to 160 miles according to the route taken.) "From Band to Kasrkand one day." (About 70 miles, passing through Bih or Geh, which is not mentioned.) "From Kasrkand to Kiz four days." This is not much over 150 miles, and is the most probable estimate of them all. It is possible, of course, that from 70 to 80 miles may have been covered on a good camel within the limits of twenty-four hours. Such distances in Arabia are not uncommon, but we are not here dealing with an absolutely desert district, devoid of water. On the contrary, halting-places must have always been frequent and convenient.

I cannot leave this corner of Makran without a short reference to what lay beyond to the north-west, on the Kirman border, as it appears to me that one or two geographical riddles of mediæval days have recently been cleared up by the results of our explorations. Idrisi says that "Tubaran is near Fahraj, which belongs to Kirman. It is a well-fortified town, and is situated on the banks of a river of the same name, which are cultivated and fertile. From hence to Fardan, a commercial town, the environs of which are well populated, four days. Kir Kayan lies to the west of Fardan, on the road to Tubaran. The country is well populated and very fertile. The vine grows here and various sorts of fruit trees, but the palm is not to be found." Elsewhere he states that "from Mansuria to Tubaran about fifteen days;" and again, "from Tubaran to Multan, on the borders of Sind, ten days." Here there is clearly the confusion which so constantly arises from the repetition of place-names in different localities. Multan and Mansuria are well-known or well-identified localities, and Turan was an equally well-recognized district of Lower Sind, of which Khozdar was the capital. Turan may well be reckoned as ten days from Multan, or fifteen from Mansuria, but hardly the Tubaran, about which such a detailed and precise description is given. There are two places called indifferently Fahraj, Pahrag, Pahra, or Pahura, both of which are in the Kirman district; one, which is shown in St. John's map of Persia, is not very far from Regan, in the Narmashir province, and is surrounded far and wide with ruins. It has been identified by St. John as the Pahra of Arrian, the capital of Gadrosia, where Alexander rested after his retreat through Makran. The other is some 16 miles east of Bampur, to the north-west of Sarbaz. Both are on the banks of a river, "cultivated and fertile;" both are the centres of an area of ruins extending for miles; both must find a place in mediæval geography. For many reasons, into which I cannot fully enter, I am inclined to place the Pahra of Arrian in the site near Bampur. It suits the narrative in many particulars better than does the Pahra identified with Fahraj by St. John. The latter, I have very little doubt, is the Fahraj of Idrisi, and the town of Tubaran was not far from it. Fardan may well

have been either Bampur itself (a very ancient town) or Pahra, 16 miles to the east of it; and between Fardan and Fahraj lay the district of Kir (or Kiz) Kaian, which has been stated to be a district of Rasak. "On Tubaran," says Idrisi, "are dependent Mahyak, Kir Kaian, Sura" (? Suza), "Fardan" (? Bampur or Pahra), "Kashran" (? Khasrin), "and Masurjan. Masurjan is a well-peopled commercial town surrounded with villages on the banks of the Tubaran, from which town it is 42 miles distant. Masurjan to Darak Yamuna 141 miles, Darak Yamuna to Firabuz 175 miles." If we take Regan to represent the old city of Masurjan, and Yakmina as the modern representative of Darak Yamuna, we shall find Idrisi's distances most surprisingly in accordance with modern mapping. Regan is about 40 miles from Fahraj, and the other distances, though not accurate of course, are much more approximately correct than could possibly have been expected from the generality of Idrisi's compilation.

I cannot, however, now open up a fresh chapter on mediæval geography in Persia. It is Makran itself to which I wish to draw attention. In our thirst for transfrontier knowledge further north and further west, we have somewhat overlooked this very remarkable country. Idrisi commences his description with the assertion that "Makran is a vast country, mostly desert." We have not altogether found it so. It is true that the voyager who might be condemned to coast his way from the Gulf of Oman to the port of Karachi in the hot weather, might wonder what of beauty, wealth, or even interest, could possibly lie beyond that brazen coast washed by that molten sea; might well recall the agonies of thirst endured during the Greek retreat; might think of the lost armies of Cyrus and Simiramis; and whilst his eye could not fail to be impressed with the grand outlines of those bold headlands which guard the coast, his nose would be far more rudely reminded of the unpleasant proximity of Ichthyophagi than delighted by soft odours of spikenard or myrrh. And yet, for century after century, the key to the golden gate of Indian commerce lay behind those Makran hills. Beyond those square-headed bluffs and precipices, hidden amongst the serrated lines of jagged ridges, was the high-road to wealth and fame, where passed along not only many a rich Kafila loaded with precious merchandise, but many a stout array of troops besides. Those citizens of Makran, who "loved fair dealing, who were men of their word, and enemies to fraud," who welcomed the lagging Kafila, or sped on their way the swift camel-mounted soldiers of Arabia, could have little dreamed that for centuries in the undeveloped future, when trade should pass over the high seas round the southern coast of Africa, and the Western infidel should set his hated foot on Eastern shores, Makran should sink out of sight and into such forgetfulness by the world, that eventually this ancient land of the sun should become something less well known than those mountains of the moon in which lay the far-off sources of the Egyptian Nile.

ON A JOURNEY FROM MACHAKO'S TO KITWYI.*

By JOHN AINSWORTH.

On the 21st ult. I left the station in company with Mr. Gilkison. I took the necessary porters and twelve askari from here, and supplemented these by the addition of fifty native volunteers. On my arrival at Mala, Mwatu desired me to take a number of his warriors. I preferred not to, however, but agreed to take twenty of his men. He then asked permission to accompany me, and to this I also agreed, as I had an idea that if I made friends with Kitwyi, I might be able to include Mwatu in the same arrangement (for years Mala and Kitwyi have been enemies, and a constant series of raids and counter-raids have been carried on). After leaving Mala, where we were liberally supplied with flour posho by the wazee (Mwatu himself having provided two bullocks for the men), we proceeded to the Athi, the route lying in a north-east direction from Mala. The Athi at this crossing is a stream some 40 yards broad, and just now is about 5 feet deep, consequently it must be impassable during the rains. Above the north-east bank of the river there is an abrupt rise of about 400 feet, terminating in a plateau or a large extent of plains. This plateau appears to continue throughout the whole course of the river on its left-hand side. The same plateau-like formation is visible from the caravan road at Tzavo and Kinani. Leaving the Athi river camp, we proceeded across the Yata plains (Athi pleateau) in north-east and easterly directions, and eventually descended to a lower level, which evidently forms part of the Thana ("Tana" of the maps, but pronounced by the natives "Thana") watershed. We encamped on the east side of the Chyanu river. The country up to this had begun with thick bush; afterwards it opened out into expanses of plains, and then assumed a park-land appearance. When nearing the Chyanu river the bush begins to be thick again. On the 24th idem we left Chyanu camp for the Tiva river, which, after a long march, we reached. The country from Chyanu begins to be hilly. From Mala to the Kakuneke hills (just above the Chyanu camp) we had been following a very ill-defined track—in fact, in some places we had no track at all; but when about 4 miles from Chyanu we struck a well-worn path, which turned out to be the main safari track between Meranga (Kikuyu) and Kitwyi, proceeding thence to the coast *viâ* Ikutha and the Sabaki. This path led us through an uninhabited country in a south-easterly direction to the Tiva river. The country may be described as rolling, and with isolated hills here and there. There are many water-courses, but all except the Mikununi river were dry. As the Mavani hills are cleared, a distant

* From a report dated "Machako's, February 6, 1895," addressed to the administrator of the British East Africa Company at Mombasa. Map, p. 452.

view of the Kitwyi hills is obtained to the east and north-east, with the lower-lying parts of the district in the medium distance, while the Ulu district is seen to the west. After a long march we reached the Tiva river, a distance of about 18½ miles from the Chyanu river camp. The country nearly up to the Mavani hills is what may be termed parkland, but from Mavani to the Tiva it is fairly thickly timbered: but, except at the Tiva river, there is no good timber. There is an abundance of game on this route. This road passes through a thickly wooded country. Very little good timber is seen. About 6½ miles from the Tiva we came across the first shambas since leaving Mala, and now we were in Kitwyi. Another 7 miles brought us to the village of the chief, Simba Mwylu, in the district of Kitwyi called Nengia. The country is fairly rough, and is intersected by several streams. There is apparently a large area under cultivation. Maweli and mohindi seem to be the principal grains that are cultivated. Cattle and goats are abundant. I should consider the country as being somewhat thickly populated. The dress and manners of the people are much the same as the Wakamba of Ulu (Machako's district), and the language is nearly the same, there being a slight change of dialect. Their mode of cultivation is somewhat varied from that of the Ulu people, inasmuch as many Swahili hoes are used, but the crop seem much the same. The houses are almost the same as those in Ulu; but one thing I noticed particularly was, that the young men and women were not nearly so artistically or fancifully dressed as the natives of Ulu. The natives seem to have taken liberally to the use of cloth.

Kitwyi is a large tract of country. The district of Nengia is the part nearest to the Ulu side of the country. Kitwyi extends north and east from Nengia. There are larger tracts of country south-east and south, extending to beyond the parallel of Kibwezi, inhabited by Wakamba. Mumoni lies about north-north-east from Nengia, and is about four days distant. Kitwyi is some 1500 feet lower altitude than Machako's.

The day we arrived at Kitwyi I met the chief, Simba Mwylu. He is a small, spare man, who speaks a little Kiswahili. He said that he knew of the "Mzungu" at Machako's very well, and explained that he wanted to be friends, etc. I explained to him that that was also my wish, and with that object I should like to meet all the local wazee. He promised that these should all come in. After the preliminaries, I told him that I should like to know about the "shauri" of the Wagiriama and their ivory. He explained that he was perfectly willing to confront the Wagiriama and have the matter thoroughly gone into, so I called the Wagiriama, who had accompanied the safari. Sara, the Wagiriama head-man, states as follows: "We were a safari of Wagiriama returning from Mumoni with ivory, and when we were near Simba's village we were attacked. Seven Wagiriama were killed; the remainder

threw away their ivory and cleared. Many safaris of Wagiriama have passed through the district, but this is the only instance, as far as I know, of any such thing having happened."

Simba Mwylu's statement runs as follows: "Some time ago two of my sons were killed and their goats and ivory taken by Wagiriama in the Giriama country, and I accuse Sara of being the murderer of my sons. In revenge this Giriama caravan was attacked. When Sara and his people passed up to Mumoni, I had not heard of the death of my people; it was only after the Wagiriama had left that I got the information, and then I and my people decided to await the return of the Wagiriama from Mumoni."

Sara admitted that some Wakamba had been killed in his country, but denied having had anything to do with the crime, and that he had only heard of it after his return to Giriama. My *decision* on the case in question was, that, the attack on the Wagiriama having occurred at a time when the Wakamba were not under any influence of the Company, they had acted simply after their own crude ideas of self-defence or vengeance, so could not be held responsible to the Company for their action. I therefore only ruled that any property taken by the Wakamba from the Wagiriama be handed over to the Company for restitution to the latter. Simba at once declared his readiness to abide by this finding, and handed over to me five pieces of ivory, which the Wagiriama recognized as theirs.

On the 25th ult. I met all the local wazee, who brought as presents four bullocks and some sheep. The result of my "shauri" with them was very satisfactory. All serious matters they promised to refer to Machako's, and they one and all expressed a wish that we should build a station amongst them. I promised to build a post, and to consider the matter of a station. After this I brought forward Mwatu of Mala, and explained that he, Mwatu, had purposely come along to make friends, and so stop the system of continual raids. Simba then came forward and said that he should be very glad to make friends with Mwatu. So a goat was brought, and the ceremony of blood-brotherhood was gone through by the two chiefs. Thus I hope raids between Mala and Kitwyi have become things of the past.

On inquiry I learned that it was a very common occurrence for Swahili caravans to pass through Kitwyi with lots of women and children. The natives say that these women come from Meru (Kenia district) and Meranga. It appears that these Swahilis sell these women in Kitwyi for cattle, and with the cattle they return to Mumoni to buy ivory. The wazee informed me that they had a shauri with a place called Givuni. They accused the Givuni people of having "lifted" twenty-five of their cattle. They asked me if I would try and settle the matter. This I promised to do, and for that purpose four wazee from Nengia accompanied me on to Givuni.

Upon coming into Kitwyi on the 25th, I induced a native to act as our guide to the village of Simba. On the way he gave us all the news, and amongst other things told us that there was a safari of Swahilis at Simba Mwylu's, and that this safari had brought in a lot of women. When questioned, he said that he could show us a boma where there were some Masai women that belonged to the Swahilis. So I went at once to this place, where I found four Masai women and two children. These we brought along with us to our camp at Simba's, and on arrival there I ordered all the Swahilis to turn up. The women then pointed out among the lot the two men who were their owners. The men denied the ownership or any knowledge of the women, but afterwards admitted that the women were their "friends," and that they wanted them for their "concubines," etc. As there was no doubt in my mind about the business (Mr. Gibson and myself were perfectly satisfied that it was a slaving matter), I arrested the two men, seized their effects, and took them along with me to Machako's. From what I heard I feel sure that there were many more women about, and no doubt the other Swahilis had been slaving; but I could prove nothing against them, and I could get no more definite information from the natives. So, considering the circumstances, I compelled all the Swahilis to leave the country, and took them on with me to Machako's. From here they have proceeded to Mombasa by the main safari route.

There is no doubt in my mind but that Kitwyi has for many years been a regular *rendezvous* for Swahili, etc., slave-traders. Some Swahilis appear to be semi-resident in the country; consequently, to any one just visiting the country there are many difficulties in the way of obtaining all the information required. And the only possible way of doing any good against this slave traffic is to occupy the country, by which I mean the building of a station with a European in command. This European could take command of Kitwyi and the adjacent country together with Mumoni. By the erection of this station, and with Machako's and the existing posts in Mala and Ngoleni, we could almost control the whole coast traffic in this part of the territory.

On the 27th ult. we left Kitwyi on our return to Ulu. Ten young men from Nengia accompanied us, with the intention of going on to Machako's to see the fort. The road lay south-west to the Tiva river. For about 5 miles from Simba's we found the country populated and cultivated. For another mile further on it was cultivated only, and then for 52 miles to the Tiva river the road lay through thick bush over a fairly level country. The Tiva here is about 30 yards wide, but is dry. Water, however, can be obtained by digging about a foot in the sandy bed. The elevation of the Tiva river camp is 3400 feet above sea-level. We left the Tiva river on the 28th ult., and passed along a level country covered with bush. A little over 5 miles brought us to the ascent of the Athi escarpment, and here again we were

amongst cultivation and population. This district is called Yata. We passed through a thickly populated and extensively cultivated district to the Athi river; the country is a very pretty one. Nearly 3 miles from the Athi escarpment we commenced a descent to the Athi river, and this descent continues for nearly 5½ miles, which makes the distance from the Tiva to the Athi about 13½ miles. The Athi at this point is some 50 yards wide, with 9 inches of water, and presents the appearance of a well-used ford. In Yata we saw very little cattle until we got close to the Athi.

The whole country is fairly well favoured with timber, and gives one the idea of recent occupation; indeed, I understand from the natives that within recent times all Yata was inhabited by Masai. But now there is certainly a very large population of Wakamba, who have come over from the Ulu side.

From what I learned, we were the first Europeans who, as far as the natives knew, had ever passed through the country.* The people here showed every confidence by coming on to the road and into camp. The elevation of this camp is 3360 feet above the sea-level, and is about 25 miles from Nengia (Kitwyi). We left the Athi river camp on the 29th ult., and proceeded in a westerly direction towards Givuni, which place we duly reached after about a 12-mile march. The road was a very rough one; it is intersected by numerous watercourses, most of which are now dry, but there is plenty of water on the route. The whole of the country passed through is thickly populated. Upon arrival at Givuni I explained to the wazee the reason why the wazee of Kitwyi had accompanied me, and they agreed to hand over the cattle. This was done the same evening, and the next day the wazee of Kitwyi left for their homes with the cattle. Several wazees of the Givuni locality came into camp with sheep as presents. Givuni and all the adjacent country seems to be very rich in cattle. There is not, apparently, so much cultivation as in other parts of the district. The height of Givuni camp above sea-level is 4150 feet.

On the 30th ult. we left for Manyala, passing through Kiteta *en route;* the road leads exactly west, and is a very tortuous one. We eventually reached the camp at Manyala after covering nearly 17 miles. The country for about 2 miles beyond Givuni is moderately cultivated; there are large quantities of cows and goats. The wazee of Manyala, who are still friends, sent us in a lot of flour as food for the men, and sent sheep for our own use.

The height of Manyala camp above sea-level is 4360 feet. All the country from the Athi to Machako's is very well supplied with water.

On the 31st ult. we shifted camp some 2 miles further along the

* Dr. L. Krapf (1849) was the first to pass through Kitwyi (Kitui) on his journey to Mumoni. He calls Milu's (Mwylu's) village Kokungu.—Ed.

road to Iyani (Manyala), and here we held a "shauri" with various wazee. They sent us in further presents of flour, and twelve loads, some sheep, and a bullock. At this point Mwata and his people left us and proceeded to Mala. This point is about 56 miles from Nengia (Kitwyi). On the 1st inst. we left Manyala on our way to Machako's, and passed through Nga into Gani, reaching Machako's at 11 a.m., the distance from Iyani being about 12 miles, which makes the distance from Kitwyi *viâ* Givuni and Manyala about 58 miles. The whole of the country from Yata to Machako's is thickly populated, and, except in one or two localities, is fairly cultivated, and right from the Athi to this station it appears to be very rich in cattle. After leaving the country between the Athi river and Givuni, trees become a rarity instead of an abundance, as in the country between Kitwyi and the Athi.

I enclose a traverse of the route, showing roughly the various positions, and I trust it will be found fairly correct. In its construction all angles have been taken by the prismatic compass; all bearings are magnetic, and the distance is taken by pacing and a watch. The base marked off was Mala, and the scale used was 5 statute miles to the inch. The position of the Kanjalu range is taken from the Railway Survey Map.

Machako's, February 29, 1895.

Kitwyi—to the east of Ulu—is a large tract of country said to be as large as the Ulu country; it has a much lower elevation than Ulu, and consequently is much hotter. The country lies between the Athi and Thana rivers, and all its rivers drain into the Thana. The people, the production, etc., are much the same in this part as in Ulu, and both are large cattle countries. Like all Wakamba, the people are keen traders. Kitwyi is on the main road to Mumoni, Meranga (Kikuyu), Thaka, and the Laikipia country.

There are * two routes from the coast to Kitwyi, one *viâ* Kibwezi and then north-east, and one which strikes nearly east from Nzawi; I should say that the one *viâ* Kibwezi is the nearest. I should estimate the country as being thickly populated and cultivated; the climate, although hotter than Ulu, is, I should say, fairly healthy, the average altitude would be from 3500 to 4000 feet above sea-level. Many of the Ulu people were not on good terms with Kitwyi, and the Kiseini people (Kiseini is north of Kitwyi, and east of the Athi river) often raid in Mala and Kitwyi, as also Givuni and Kitwyi were up to lately enemies, but I am pleased to say that our intervention has done away with that state of things. Mumoni, Thaka, and Meranga (in Kikuyu) and Nzawi are all friends of the Kitwyi people.

* A third striking across to the junction of the Tzavo with the Athi, and thence by Bechuma, etc. (J.R.W.P.).

Since the occupation of Ulu by the Company, Kitwyi has been the principal *rendezvous* for slave-traders in this part of the territory. Our late expedition there, and the fortunate capture of some Swahili slave-traders red-handed in their business, will, I feel sure, have a good effect in Kitwyi; but, in my opinion, it is urgently necessary that the country be occupied, and be administered by nearer means than Machako's. There is, I understand, a lot of traffic in ivory and slaves through Nengia (Kitwyi), and of these caravans some pass down the Sabaki to Takaungu, while others strike right across German territory, and eventually make Pangani. Independent of the above-mentioned traffic, there is a very fair trade in cattle, etc., in the country, and many Swahilis are at times semi-resident in the country; many Wagiriama traders also come into this country and Mumoni to buy cattle and ivory, and at times many Kitwyi people go down to Giriama and Mombasa to trade.

Another important matter is as follows. In Meranga there are a great many unfortunate Masai women slaves of the Wakikuyu. Many of the Swahili traders coming through Meranga from Baringo, Kavirondo, etc., buy a lot of these women cheap; the Swahilis then come to Kitwyni, where they sell some of these women for cattle. They then send a party to Mumoni with their cattle to buy ivory. I understand that the Kitwyi people will not undertake the risk of taking cattle to Kikuyu to buy women, while, on the other hand, the Wakikuyu will not risk bringing the women into Kitwyi, and so the Swahili is the middleman. To control all this it is very necessary that a European officer should be resident in the country.

Personally I am very well pleased with the result of my visit. I found the people very friendly, and very anxious that a European should come and reside amongst them. On my return several young fellows accompanied us to Machako's, mainly to see the station, etc.

GEOGRAPHICAL WORK OF THE GEOLOGICAL SURVEY OF CANADA IN 1895.

By Dr. GEORGE M. DAWSON, C.M.G., F.R.S.

THE work of the Geological Survey of Canada in 1895 has been largely devoted to the systematic mapping of definite areas, and did not include nearly as much geographical exploration as that of the preceding year.

In British Columbia, Mr. R. G. McConnell and Mr. J. McEvoy were engaged respectively upon the West Kootanie and Shuswap sheets of the geological map, the geographical and topographical delineation of the country proceeding in both cases concurrently with its geological examination. A great development of mining is in progress in British

Columbia, more particularly of the precious metals, and the West Kootanie district is now occupied by a large mining population, although a few years ago it was practically an untrodden wilderness.

To the east of the northern part of Lake Winnipeg, in Manitoba, Mr. J. B. Tyrrell carried out surveys of an exploratory nature, laying down the courses of several rivers and ascertaining the positions of a number of lakes, as well as the geological character of the country, which proved to be characterized entirely by granitic and gneissic rocks.

In the Rainy river and Thunder bay districts of Western Ontario, Mr. W. McInnes completed the information necessary for the Seine river and Shebandowan map-sheets, and a preliminary edition of the first-named sheet has been published, in order to meet the requirements of the miners engaged in the discovery and preliminary exploitation of auriferous quartz-veins there. The rocks met with are all referable either to the Laurentian or to the Huronian system, the latter being that containing the gold-bearing deposits. Similar conditions recur in the country adjacent to the Upper Ottawa, in the vicinity of lakes Temiscaming and Nipissing, where the greater part of the season was spent by Mr. A. Barlow. The adjacent Sudbury district is well known because of its nickeliferous pyrrhotites, and similar ores are in process of discovery in the Huronian rocks of the farther region here particularly referred to. It includes also one of the typical Huronian areas originally described by Sir William Logan, the re-examination of which, in the light of modern petrographical methods, is producing many facts of scientific interest.

Systematic surveys of both sides of the lower part of the Ottawa were also continued by Dr. R. W. Ells, and in the tract between the Ottawa and St. Lawrence by Mr. N. J. Giroux. The general geological features have here long been known, but they are now being laid down for the first time in some detail on the scale of four miles to the inch.

In the northern part of the province of Quebec, an exploration of considerable geographical and geological interest was carried out by Dr. R. Bell, who crossed the height of land from Grand lake, near the sources of the Ottawa, and descended the Nottaway or Noddawai river to its mouth on James bay. Much of the country traversed, although relatively near to inhabited centres, had not before been mapped, and it had remained uncertain whether the stream known to rise near Grand lake was part of the Nottaway system or that of a river emptying further to the west, in Hannah bay. A large area of Huronian rocks was here again met with.

Examination made in that part of Quebec to the south of the St. Lawrence by Mr. R. Chalmers, were directed chiefly to the alluvial gold deposits and to the facts of the glacial period which bear directly

upon these. Terraces marking late-glacial sea-margins were measured to a maximum certain height of 885 feet, and evidence appears to be accumulating to show that these represent the "Iroquois beach," or terrace, of the region of the Great lakes, and these must in that case have been at the time in direct connection with the sea, forming an extensive inlet.

To the north of the Gulf of St. Lawrence, Mr. A. P. Low continued his explorations of the Labrador peninsula by ascending to the sources of the Manikugan river, and examining a tract of country on both sides of the main watershed about its sources. Granites, with Laurentian gneisses and limestones, and intrusive masses of anorthosite, characterize the whole region traversed.

In Nova Scotia, Mr. H. Fletcher was employed in revising the maps of the Sydney coal-field of Cape Breton, preparatory to the issue of a new edition of these; and Mr E. R. Faribault continued his detailed mapping of the Cambrian gold-bearing rocks of the Atlantic coast, for publication on the sale of a mile to the inch. The auriferous quartz-veins are here intimately connected with the anticlinal axes, which it is therefore necessary to trace out with all practicable precision.

In the absence of any trustworthy, detailed, and connected topographical surveys, all the work above outlined has implied measurements and traverses of country adding materially to geography. It is impossible, under the circumstances, to employ methods of great precision, the means adopted being in each case commensurate merely with the requirements of the scale adopted, but the resulting maps are always far in advance of any previously existing.

During the year 1895 twenty-six maps in all have been issued by the Geological Survey.

GENERAL CHAPMAN'S PROPOSED MAPPING OF AFRICA.

Mr. J. Temple Horne, the surveyor-general of Cape Colony, has issued a report dealing with General Chapman's proposals, and directs attention to the important geodetic surveys which have been carried out in South Africa since 1840. A complete series of primary triangles already connects Cape Town with the country near the lower Orange river and with Natal. In British Bechuanaland surveying operations were begun in 1886, when Lieut. Laffan measured a base-line near the Hart river, and a series of primary triangles has now been carried from the twentieth meridian to the boundary of the South African Republic. The work still to be done to render this colonial network of primary triangles complete includes the measurement of three additional chains of triangles, namely, one across the Orange Free State, joining Natal to Kimberley; a second to join Kimberley to the eastern part of the

Bechuanaland survey; and a third connecting the western part of that survey to the triangulation carried by Sir Thomas Maclear in the direction of the lower Orange river. With a view to a further extension of geodetic operations, the surveyor-general suggests that three chains of triangles should be pushed due northward, namely, one in the west, through German South-West Africa; a second, in the centre, from Kimberley to the Victoria falls of the Zambezi; and a third, in the east, from Natal to the Zambezi. These three chains would be joined by a cross-chain of triangles following the parallel of lat. 18° S. He proposes, moreover, that simultaneously with this triangulation, and in connection with it, a staff of trained surveyors should be employed to make rapid topographical surveys. The work thus proposed would necessitate the co-operation of the governments of Germany, the South African Republic, and Rhodesia; and he suggests that the combination of work of this kind should be entrusted to an international commission, organized on the lines of the Geodetic Institute, which has for many years directed the geodetic operations in Europe.

We hail Mr. J. T. Horne's scheme most cordially, and trust that he may be enabled to carry out the work proposed. In the mean time, it might be of some service to utilize the telegraph, which already joins Kimberley with Lake Nyasa, for determining a number of good longitudes.

A map of Cape Colony on a scale of 1:800,000, based upon this triangulation and other surveys, is stated to be nearly ready for publication.

RECENT GAZETTEERS.

THE announcement of a new Gazetteer too often conceals the production of old work under a new title, with superficial revision enough to support a specious prospectus. It is consequently with feelings of grateful acknowledgment, which will be shared by all working geographers, that we are able to call attention to two Gazetteers of the World recently completed, which are new in the best sense, in being original compilations from official sources. The first * and, larger is French in authorship and publication, but cosmopolitan in scope and aim. Commenced in 1879 by M. Vivien Saint-Martin, it was completed last year by M. Louis Rousselet, and the fact that it has been sixteen years in course of publication is its most serious defect. The seven large quarto volumes, comprising close on twenty thousand columns of close print, are already in course of being brought up to date by an extensive supplement,

* Nouveau Dictionnaire de Géographie universelle contenent la Géographie physique, la Géographie politique, la Géographie économique, l'Ethnologie, la Géographie historique, la Bibliographie. Ouvrage commencé par M. Vivien de Saint-Martin, et continué par Louis Rousselet. Paris: Hachette et Cie. 7 vols. 1879–1895.

which is intended to be bound with the main work, and is published without pagination, so that it can be divided and placed at the end of each volume, or bound as a supplementary volume. The 'Dictionnaire' is really a concise geographical encyclopædia, the articles on continents, countries, and provinces running to a considerable length, and all of them are systematically subdivided on a uniform plan, so that reference is easy. Admirable bibliographies are added to the longer articles, and this feature of itself renders the work invaluable to students seeking farther information than the notices contain. M. Vivien Saint-Martin's work is a companion for a student, and as a standard work of reference it has made its reputation, and will long retain its value. We call attention to it particularly because there is no English work on the same scale; and, indeed, we know of no book so likely to yield satisfactory information regarding an out-of-the-way part of the world. The orthography is very carefully attended to, but of course, in the case of phonetic renderings of native names in Africa and other undeveloped lands, and in the transliteration of Russian, the French system is employed; in the case of all civilized states, however, the official spelling is followed.

A smaller but, in its own way, equally important work is that compiled by Mr. Chisholm,* who has made it a model of comprehensiveness and compactness. Being of somewhat cumbrous dimensions, the book is less handy than if it had been bound as two smaller volumes; but there is an advantage in having all the information it contains compressed between two boards. In three thousand five hundred columns Mr. Chisholm has compiled an entirely new Gazetteer, every article written afresh, replete with the latest statistics, and verified by competent authorities. Besides the names of ten authors who have contributed signed articles on important places and subjects, a list is given of three hundred and twenty-four persons who have assisted in revising notices. These facts of themselves give great confidence as to the trustworthiness of the work, and repeated testing of the references entirely confirms that confidence. Mr. Chisholm has devoted special attention to the spelling of place-names, and his Gazetteer is the nearest approach yet made to an authentic geographical index carried out on the principles laid down by the Royal Geographical Society. Numerous common prefixes to geographical names receive a note explaining their meaning and application, and, in addition to modern place-names, a certain number of obsolete and classical synonyms is introduced. General subjects, such as oceans, continents, etc., are also included. Populations are dealt with in a somewhat novel way, being expressed in round numbers, and, in the case of villages and small towns, often given as < 500, < 2000, etc. This,

* Longmans' Gazetteer of the World. Edited by George G. Chisholm, M.A., B.SC. London: Longmans, Green & Co, 1895. Pp. 1788.

while quite close enough for purposes of general reference, makes correction of the statistics in later editions a much easier task than it would otherwise be. There are some omissions, due undoubtedly to accident, but, all in all, the work is full and very thorough, and has the crowning advantage of being all brought down to one date, and that date is the very year of publication. The labour involved in the compilation of such works can hardly be imagined by those who have not taken part in similar productions, and it is pleasant indeed to see a Gazetteer where every labourer gets due credit for the part he has taken in it. For this possession Messrs. Longmans have earned the gratitude of all who require fresh, accurate, and responsible information as to places at home and abroad.

On a similar plan, though with a different balance, we may note the new edition of Ritter's well-known German Geographical Dictionary.* It is too familiar to geographers, and too much valued, to require more than a statement of the publication of the new edition.

Mr. Brabner's Gazetteer † is on a different footing from the others we have noticed, as it refers only to a small area—that of England and Wales—and appeals to popular rather than to scientific demands. There are numerous maps, town-plans, and many illustrations of scenery, and the details given of the parishes, the churches, the statistics, including the value of the various livings, should be of interest locally. The limitation to England and Wales deprives the work of some of its value, and the absence of a date on the volumes is to be regretted. A praiseworthy effort has been made to bring the articles up to date; it has not been always successful.

DR. PARTSCH'S 'SILESIA,—A GEOGRAPHICAL STUDY.'

Differences of opinion as to the precise limits of geographical science, or the best methods of describing particular countries, cannot be wholly removed by mere abstract discussion alone: the final judgment must rest on criticism of a body of original work contained in individual geographical monographs. It is only after the operation of a special method has been fully observed in its application to different branches of the subject, that it becomes possible to decide upon its effective merits. The 'Landeskunde von Schlesien,' by Professor Dr. Joseph Partsch,‡ a brilliant example of the successful application of certain

* Ritter's Geographisch-statistisches Lexikon. Achte vollständig umgearbeitete vermehrte und verbesserte Auflage. Unter der Redaction von Johs. Penzler. 2 vols. Leipzig: Otto Wigand, 1895.

† The Comprehensive Gazetteer of England and Wales. Edited by J. H. F. Brabner. London: William Mackenzie (not dated). 6 vols.

‡ *Schlesien*, 'Eine Landeskunde für das deutsche Volk-auf wissenschaftlicher Grundlage bearbeitet, von Dr. Joseph Partsch, ord. Professor der Erdkunde au der Uendersität Breslau.' I. Teil. Das ganze Land. Mit 6 farbigev Karten und 23 Abbildungen. Ferdinand Hirt: Breslau, 1896.

geographical methods, may be taken as an excellent specimen of the kind of work to which we refer. Equally removed from the encyclopædic compilation and the merely entertaining popular narrative, it is remarkable both for its wealth of information and for its power of graphic description. The first volume (just published) pictures the country in its purely natural aspects, and explains how far the civilization and history of the inhabitants are dependent upon these. The second volume (not yet issued) contains—arranged according to locality—detailed studies of individual districts which have gained marked characteristics through the joint influences of their natural peculiarities and their inhabitants.

The general interest, to which this work may justly lay claim, arises from its subject as well as from the mode of treatment. Silesia, that "zehnfach interessante Land," as Goethe called it, deserves the epithet partly because of the great variety of its surface, due to its situation on the border of the "Schollenland" of Western Europe, towards the two other tectonic regions into which the European part of the Earth's crust is divided—the plateau of North-Eastern Europe, and the "Faltengebirge" of the Alpine system (in the Carpathians); and partly because it has been the scene of great events in European history. In the year 1241 the weight of the Mongolian inrush was borne by the Silesian knights at the battle of Wahlstatt; and again Silesia was noted in the wars of Frederick the Great, the most fruitful part of the long series of conflicts being that of which, in consequence of its position, Silesia was the scene. This matter of position, exactly on the crossing of the two great trans-continental lines—that on the one hand joining Western Europe with its moderate climate, its cultivations, and its civilization to the great Russian plateau, and that on the other dividing Northern from Southern Germany—is at the same time responsible for the fact that Silesia has never developed into an independent political unit, but has always been more or less indebted to her neighbours. Not only from Germany, but from Bohemia, Poland, and even Hungary, has Silesia sought for the political support necessary to enable her to develop her immense natural resources in peace. Since Frederick the Great's time by far the greater part of Silesia has belonged to Prussia (15,558 square miles), only two small regions, separated from one another by the north-eastern extremity of Moravia, belong to Austria (1989 square miles). From a review of the development of the regional geography of Silesia up to the present time, its position in the European economy can be described in the manner just indicated, and by an inquiry into the linguistic and documentary evidence as to the origin of the name (from "Pagus Silensis," a Germanic tribe which, in the migration with the Vandals, reached the southern point of Spain, and there disappeared), the historical idea of Silesia can be traced through a comprehensive view of the development of its political frontier, and the relation of that frontier

to its natural boundaries. In Dr. Partsch's book the greatest amount of space is devoted to a description of the mountain structure, which is treated from a strictly morphological point of view in a singularly luminous manner. First, there are the Beskids, culminating in a conical sandstone peak, the Lysahorn (4360 feet), and crossed by the Jablunka pass, which forms the closest connection between Silesia and Hungary; then, in the south and south-west, the Sudetic mountains, culminating at 5280 feet in the Schneekoppe, and forming the true boundary between Prussia and Austria; and finally, in the south-east, the hill country of Upper Silesia, with its great mineral wealth, backed by the Annaberg (1350 feet), the most easterly cone of Tertiary basalt in Europe. Further to the north-east and north the watershed is circumscribed by the wide valley courses running east and west, which Behrend has shown to be the beds of glacial streams; and between this region and the Sudetic mountains lies the Silesian plain, a notable south-eastern offshoot of the great plain of North Germany, formed from the ground moraines of ice masses derived from the same sources as the huge glaciers which overflowed the north-eastern counties of England during the Glacial period. The perspective of the picture is made more striking by a glimpse into the unmeasured geological past; the sequence from the epoch of the oldest gneiss to the disappearance of the last of the glaciers, passing before the mind of the reader in a series of vivid pictures.

The water-system of the country is wholly related to the Oder and its tributaries. The description centres round its natural distribution, and leads to an inquiry as to the resulting facilities for inland navigation. Considerable attention is necessarily given to the climate; Silesia lies in the same latitude as the Thames, but while the mean temperature of the warmest month in London is 64·2° Fahr., at Breslau it is 65·3° Fahr., and the coldest months average 38·3° Fahr. and 31·5° Fahr. respectively. More to the eastward the extremes of temperature are greater. At Saratow, on the Volga, we find 71·1° Fahr. and 13·6° Fahr., and the climate of Silesia may accordingly be regarded as intermediate between the oceanic and continental types. Dr. Partsch discusses the distribution and variations of temperature, humidity, and rainfall, the last from approximate data published by himself in Kirchhoff's *Forschungen* last year. The consideration of the flora and fauna from the climatic point of view, introduces the subject of the distribution of population; the changes which have taken place during historic time are investigated with the help of the older maps—one in an edition of Ptolemy being of special interest. Many new facts have been brought to light concerning the earlier periods, and the modern conditions are dealt with statistically. Since the middle of last century, the population has nearly quadrupled (in 1890 it was 4,225,000). The retreat of the Polish language before the German, which began in the twelfth

century, has ceased during the last thirty years; the Polish element now constitutes about 23 per cent. of the population. The Catholic and Evangelical creeds are pretty evenly balanced.

GLASER ON THE ABYSSINIANS.—REVIEW.*

Dr. Glaser has already contributed valuable work towards the elucidation of old-world history and geography in his 'Skizze des Geschichte Arabiens,' published six years ago; meanwhile he has travelled much, and collected many inscriptions in Yemen, and has made as many friends amongst the shiekhs in Arabia as he has enemies amongst the savants of Austria, his native country. The work before us is undoubtedly a great contribution to science, though dealing with only one side of his subject, namely, the tracing of the origin of the Abyssinian kingdom to its home in Arabia. Habasat or Pwent, commonly called Punt, was their original home, a land just east of the Mahir country in South Arabia, now known as Dhofar, where they gathered frankincense and myrrh, and then they carried this trade with them to Somaliland and Abyssinia, founding the kingdom of Axum in this latter country. From inscriptions found by Dr. Glaser in Arabia, and from those brought home by Mr. Theodore Bent from Abyssinia, the identity of the old name of Habasat on both sides of the Red Sea is clearly established, and the derivation of Abyssinia from it proved.

Habasat, or Habis, was used in most ancient times. Max Müller, in his work, 'Asia and Europe,' p. 116, states that an old name of the inhabitants of Pwent, which, however, only appears in poetical use in Egyptian texts, was "the people of the district of *Hbst*," "the *Hbsti*." Dr. Glaser says that this term Habasat extends over both sides of the Gulf of Aden, and included Somaliland, and that Egyptian ships probably traded with all these coasts, and adds, "We not only find up to the present day along a great stretch of the South Arabian coasts, but also inland from them, as well as in Sokotra, a peculiar idiom which agrees with no pre-Islamite idiom as closely as with Amharic, a circumstance which also struck Basil, the author of the 'Periphes' (56–67 A.D.), and he mentions that from ancient times nearly the whole of the African coast from Ras Hafun to the Portuguese possessions had been conquered by the inhabitants of Musa, and therefore belonged to the then kingdom of Saba and Raidan."

After remarking upon the apparent identity of the peoples described as Habasat, Punt, and Kas (Kush), Dr. Glaser says that Habasat strictly means nothing but collectors or gatherers of aromatic roots and gums, in

* 'Die Abessinier in Arabien und Afrika,' by Dr. Edward Glaser. Herman Lukaschik: Munich, 1895.

which capacity they were known to the civilized world, and with whom all dealers in similar commodities were confounded, no matter where they lived, and the name Ethiopian may also sometimes have been used to mean the same. Dr. Glaser's new derivation for the name Ethiopia he bases on the south Arabian word "Tib," or "Taib," found in inscriptions to mean incense trade, the plural of which is *Atjúb*, or *Atiob*. A man who occupied himself with this trade is *Atiobian*. This pure Arabic word he considers has been Hellenized, and the fanciful derivative of "dark complexioned" or sunburnt given to it, and it is curious that of all the dark-complexioned people of Africa, the Ethiopians should be singled out to bear that title.

It is a great pity that the new and interesting information contributed by Dr. Glaser in this book should be given in such a polemical spirit. Prof. D. H. Müller is also an authority on these subjects, and Oriental professor at the University of Vienna; he agrees with Dr. Glaser in the main points, but in others they disagree, and it is not pleasant to find Dr. Glaser alluding to the professor as his "arch enemy" (Hauptfeind), and abusing his country in unguarded terms. Whether his complaints against Dr. Müller and his country are founded or not, the rabid attacks on them which appear on every page can only be looked upon as a great disfigurement to his book.

Dr. Glaser announces that a Munich firm is casting type to correspond with the alphabets of all the different kinds found by him in South Arabia, so that from the printed copy its age can be determined. This type not being ready, and Dr. Glaser declining to use any at present existing, the reader has to put up with his Hebrew transliteration, which is also a great disparagement, and renders criticism of the inscriptions, as they are at present given to the world, impossible.

We can only hope that Dr. Glaser's accuracy with regard to long-vanished ages is greater than it is with regard to events which may be said to have happened under his very eyes, and about which he could easily have obtained first-hand information. The following quotation will illustrate this feature in his work: "The Englishman Theodore Bent, who has for several years travelled with his wife in the countries surrounding the English colonies, in order, as Dellman expressed it in a publication of the Berlin Academy, 'to knit up friendly relations with the chiefs,' after having visited Mashonaland, since become English, went on to East Africa, and in 1892 turned his eyes on Abyssinia, and has since exerted himself to carry the British flag through Arabia. In Abyssinia he rejoiced in the kindest and most willing support of the Italian government, but arrived just at the moment when an Anglo-Italian *entente* for the reconquest of the Sudan was spoken of."

THE ISLAND OF SAKHALIN.*

By Professor von KRASNOW.

By its geological structure, this, the northernmost island of the Japanese group, forms a part rather of Siberia than of Japan. The volcanoes which are such a characteristic feature of Japan are here entirely wanting, and the three parallel chains of mountains which form the skeleton of the island are similar in formation to those of Eastern Siberia. They are composed of Jurassic slate, Cretaceous strata, and Tertiary sandstones, and clothed with thick forests seldom visited even by the native hunters. Inasmuch as the mountains reach in the interior an average elevation of 6000 to 7000 feet, it is evident that the vegetation of the island must be very varied. Still greater differences, however, are caused by the abnormal climatic conditions of the island; for although Sakhalin lies between the latitudes of Trieste and Hamburg, its conditions of life are almost polar. Bathed by two cold marine currents, it is exposed without protection in winter to the cold north-west winds of the East Siberian anticyclone, and an abnormally cold winter is associated with an abnormally cold summer. Even in May snow lies at the sea-level in open sunny spots, whilst in the thick forest it often remains on the ground until June, and in crevices until July. Snowfalls occur down to the end of May, and frosts to the middle of June, the latter beginning again as early as September, at the end of which month snow again falls. On account of the cold currents which bathe the island, distance from the coasts plays an important part in relation to the vegetable covering, giving rise to anomalies perhaps observable on no other portion of the Earth's surface. In Siberia, and even in Central Europe, it has many times been noticed that during the winter cold the mountain summits are much warmer than the plains. There is a saying in the Tirol, "Steigt man im Winter um einen Stock, so wird es wärmer um einen Rock." The same holds good in Sakhalin. The cold and heavy winter's air collects in the lower regions, whilst above the mountain heights enjoy the warmer sea-breeze. But since even in summer the cold comes from the surface of the sea, the mountains display all the year through different temperature conditions to those we are accustomed to in Europe. Thus while an arctic vegetation prevails on the sea-shore, forests with sub-tropical Japanese species occur at a certain elevation, and only on the highest summits does the forest again give place to arctic plants.

The principal component element of the forest consists of pines, firs, and Siberian larches—*Pinus ajaniensis*, *Picea Sakhalensis*, and *Larix dahurica*. The young trees grow thickly together, so that in the struggle for existence they kill one another, and but few individuals of a larger size survive. For this reason all the intermediate spaces are filled up with standing or lying skeletons of trees, which make these forests impassable for man. The flora resembles that of North Lapland. On the west side of the island the woods have a more mixed character, especially in the south-west, where the milder climate permits the association of the maple (*Acer spicatum*), *Betula Ermanni*, and large numbers of *Sorbus aucuparia*, with the coniferous trees. At a certain height, especially in the interior of the island, these woods lose their hyperborean character, and quite suddenly sub-tropical forms of the sunny south make their appearance. Beneath the evergreen foliage of the *Taxus baccata* rise high bushes of the Japanese *Flex crenata*, and stems of bamboo as high as a man—true Indian jungle beneath the conifers of the far north—bush-like *Vaccinium*, fine Hydrangeas, which, as in the evergreen forests of the Himalayas, grace the woods with their blue flowers, whilst colossal leaves of *Araliaceæ* and

* Report of Paper read at the Berlin Geographical Society, January 4, 1896.

Petasites cover the banks of streams. Only on the highest summits does the forest disappear, and is replaced by dwarf firs—*Cembra pumila*—and evergreen stretches of *Empetrum nigrum*.

Where the sea-shore is flat and exposed to the winds, a regular arctic tundra vegetation prevails. Trees are entirely wanting, or at most form stunted growths, spreading horizontally only, under the shelter of sand-hills. The true tundra region, however, is not on the sea-shore, but in the great longitudinal valleys connected with the structure of the island, especially in those of the Poronai and Tym. With the exception of a few swampy meadows, covered with *Spiræa salicifolia*, these plains form a polar tundra with frozen soil, peat-bogs, and arctic vegetation. In no other part of the world does the tundra-formation extend so far to the south as in Sakhalin, where it occurs under the latitude of Trieste, and where reindeer also are met with in large numbers.

The tundras of these valleys owe their existence, not to the cold winds, but to the unfavourable drainage of the soil. On well-drained soil and on steep mountain slopes no arctic flora grows, but only on the level plains. The nearer we approach such plains from the direction of the mountains, the more does the habit of the woods change. The pines and firs have a stunted appearance, and by degrees disappear altogether, only larches taking their place. The vegetation of the larch woods differ fundamentally from that of the pine forest. It consists of a variety of tundra plants, and possesses much scientific interest from the point of view of the history of the development of the plant world. It is well known that the east coast of Asia, with its chain of islands, has had no glacial epoch: from the equator to the polar regions it enjoys a moist climate, corresponding in the south to that of Tertiary times, and in the north to that of the pre-Glacial epoch. Under the influence of the gradual cooling, the elements of the sub-tropical vegetation which formerly prevailed were but slowly extinguished. Like "living fossils," representatives of this flora, such as *Juglans mandschurica* and *Vitis Thunbergi*, still remain in particularly favourable spots in Sakhalin. But side by side with the extinction of the more southern flora, a gradual conversion of sub-tropical into arctic forms may be observed. In the region of the East Asiatic islands, almost the same evergreen species, belonging to the same families, occur on the high summits of the mountains (*e.g.* on the Javanese volcanoes) and on the border of the polar region; and in this way the plants of the Sakhalin peat-bogs are biologically near allies of the trees of the tropical moist forests. Nothing similar is to be observed in Europe, because here the original vegetation was destroyed by glaciation, and we have now to do only with the subsequently introduced forms.

The peat-formation on the tundras of Sakhalin reaches in many places a thickness of 50 feet, and beneath it upright fossil larch-stems, which have been buried *in situ*, can often be seen. The destruction of these woods might be ascribed to a change of climate, but another explanation may also be found. As was mentioned above, the snow, owing to the cold and gloomy summer, lies as late as July under the shelter of the forest on badly drained clayey soil. The surface, constantly damp, becomes covered with a growth of swamp vegetation, which more and more prevents the access of the summer air and the thawing of the soil. Thus the conditions become more and more unfavourable to the growth of the forest, till even the moisture-loving larch gives place to the bare tundra. All the wide plains of Sakhalin have therefore been transformed into tundras and half-frozen peat-bogs, and a true polar landscape prevails wherever mountains or hills are absent.

A single exception is formed by the banks of streams, which show the sharpest contrast to the tundras, being clothed with the most luxuriant vegetation to be seen anywhere in the island. The appearance of the landscape corresponds to that

of desert regions, where also the courses of streams are fringed with forest. At a distance of a quarter to half a mile, the peat-bog gives place to a charming meadow of *Calamagrostis* grasses, with park-like groups of birches, poplars, willows, *Fraxinus excelsior*, *Ulmus*, etc. But the most striking is the bush vegetation. *Polygonum Sakhalineuse*, *Senecio palmatum*, and other plants, with stems 6 feet or more in height, overtop the traveller, making the use of a hatchet as indispensable as in the tropical forest; and he can scarcely believe, as he sees around him fine tropical butterflies, that he is in the immediate neighbourhood of herds of reindeer and the ever-frozen tundra.

Before the advent of the Russians and Japanese, Sakhalin already possessed four distinct races which had entered the country from the south or west. The most interesting of these are the Gilyaks, who are not becoming extinct like most of the primitive races of North-East Asia, but thrive and maintain their customs and religion. Physically they are true Mongolians, and wear clothes of the Manchu style, with long pigtails like the Chinese, from whom they are distinguished, however, by their more robust physique and darker colour. Their religion consists in a reverence for the unseen spirits of the sea, the woods, and the mountains, to whom offerings of food and the most prized possession of the Gilyaks, tobacco, are made. The bodies of the dead are burnt, and the ashes preserved in special small huts. The women of a clan are the common property of all the men, and, on this account, all the members thereof consider each other as brothers and sisters, fathers and sons. Each family has a summer dwelling to itself, built without a window, of piles and pine logs, and covered with birch bark. The winter dwellings are of the same type, only much larger, and in them all the members of the clan live together. They have no villages, and, beside dogs, they possess no domestic animals. They are a true tribe of fishermen, in contrast to the Tunguses, who live by the rearing of reindeer on the tundras. On the mountains lives the dwindling tribe of hunters called Orochones. Both are nominally Christian, and are few in numbers. There are still Ainos living in the south of the island. Their dress is Japanese, only they wear, like the peasants of Great Russia, shoes of bast. In their customs they are sharply separated from the Ainos of Yesso, the women, *e.g.*, never painting themselves blue mustachios.

In addition to these indigenous races, there are also the Russian exiles, who number about 17,000. Those newly arrived begin by working several years in the coal-mines or in the forests, where they make roads and cut timber. Afterwards they are made to live five years in villages, practising agriculture and cattle-rearing. But as the climatic conditions are very unfavourable to agriculture (in the south only rye, vegetables, and potatoes will grow, oats and fruit-trees flourishing nowhere; while in the north nothing but potatoes and the most northern cereals can be cultivated on exceptionally favourable spots), this village life is still more wretched than that during the period of penal servitude in the mountains. After this the exile becomes free, and is permitted to settle in East Siberia. Every one takes the earliest opportunity of leaving the inhospitable island, and, as a rule, settles in the neighbourhood of Vladivostok. On this account the inhabitants of the villages change every five years, and the advance of cultivation is but slow. Coal-mines, petroleum, and fisheries (as yet in the hands of the Japanese) form the natural riches of the island, which should acquire great importance when the Siberian railway is completed.

THE MONTHLY RECORD.

THE SOCIETY.

The Society's Educational Prizes.—The following candidates for Queen's scholarships, under the Scottish Education Department, were successful at the December examination in obtaining the prizes for proficiency in geography offered by the Society. MALES.—*Prizes of* £2 *each*: William Forsyth, James Henderson, Alexander D. Morton. *Certificates:* Andrew Shanks, Samuel Wilson, James Downie, Thomas McCririck, James A. Thomson. FEMALES.—*Prizes of* £2 *each:* Agness Rae, Mary Craig, Elsie Fairweather. *Certificates:* Alice M. Lockhead, Isabella S. Sievwright, Mary E. P. Smith, Mary Walker, Elizabeth Davidson. The medals offered by the Society in connection with the Cambridge Local Examinations, held in December, 1895, were awarded to (Senior candidates) Gertrude Annie Lewis, Ernest Edwin Minns; (Junior candidates) Walter Clement Barker, George Malcolm Young.

EUROPE.

The Evolution of the Baltic.—Professor Rudolf Credner read a paper to the annual meeting of German naturalists and physicians at Lübeck in 1895, on the origin of the Baltic Sea, in which he sketched from geological evidence the changes which that region had undergone down to the present time. He rightly looks upon the present condition of the Baltic as merely a stage in its evolution, and points out that gradual changes in its coast-line are continuously in progress. The original cause of the hollow is shown to be movement of the crust, which, by a series of faults, let down a portion of the surface, consisting of different geological series; but the basin thus formed has been profoundly modified by processes of erosion and accumulation, the result in large measure of ice-action. After the main features of the Baltic were blocked out, many striking changes were brought about by gradual elevation and depression, the history of which is deciphered by the evidence of the fauna of the sea, which was at one time that of salt water, again of brackish water, then of fresh water, and so on, as the rising or falling of the crust brought the general depression more freely into communication with the outer ocean, or restricted or completely cut off its outlet. At present a period of slow elevation seems to be proved by observations on the Scandinavian and Finnish coasts.

Novaya Zemlya.—At the meeting, on January 2, of the Russian Geographical Society, M. Th. Chernyshev gave an account of the geological expedition which visited Novaya Zemlya during the last summer. Having left Archangel on July 22, on board the *Vladimir*, the expedition landed at Matochkin Shar eight days later, explored its coasts, and entered the strait; but it could not reach the Kara Sea on account of ice blocked in the eastern part of the strait. Gribovaya bay and the settlement of Little Karmakuly were next visited and explored, the expedition crossing Novaya Zemlya in the latitude of this last station, and reaching the Kara Sea at Abrosimov bay. It took six days to perform this journey on sledges. Pukhovaya bay and Goose land (Gusinaya Zemlya) were also explored; and on September 21 the expedition was back at Archangel. Surveys and astronomical determinations were made, and also rich geological collections. The chief point of interest is, that proofs have been found of the glaciation of the land during the ice-age, and of its secular raising during recent times—at least, for the southern island of Novaya Zemlya.

Vegetation of the Peloponnesus.—Dr. A. Philippson has, in the twelfth number of *Petermann's Mitteilungen*, 1895, a map of the vegetation of the Peloponnesus, on the scale of 1 : 625,000, showing by different colours the distribution of firs, black pines (*Pinus Laricio*), Aleppo and stone pines (*P. halepensis* and *P. pinea*), oaks, cultivated fields, including ordinary and currant vineyards, cultivated trees (olives, oranges, lemons, etc.), and, under one colour, maquis, phrygana, natural pastures and herbage, and bare tracts. Maquis are dense evergreen scrub; phrygana, small dry prickly shrubs thinly scattered over the surface. The map is based on Dr. Philippson's journeys in 1887–1889. In the text accompanying the map, Dr. Philippson lays stress on the steady destruction of forests, and on the general degradation of the natural vegetation—that is, the displacement of more by less luxuriant forms. The disappearance of the forests he ascribes in a large measure to the characteristics of the Mediterranean climate, which is less favourable to the recovery of devastated forest than that of cooler and moister countries. In the Mediterranean region, with its scorching rainless summers, its mostly violent rains in other seasons, and its rare frosts, the formation of new soil is slower and denudation more rapid than in Central and Northern Europe. Hence when forests are destroyed, bare rocky slopes are exposed, unless maquis succeed in getting a hold before the last of the soil is washed away. When the maquis again are removed, whether by accidental fires or by the action of the charcoal-burners (their great enemy), their place is taken by still more meagre forms—either the stunted kermes oak or the scattered prickly phrygana. This process is still going on, and in Eastern Greece vigorous growths even of maquis are beginning to be rare. When tillage is at once begun on the site of extirpated forests, the course of events is rather different. This helps to protect the soil; but when, as has happened many times in the history of Greece, agriculture is neglected in places for a series of years, the soil gets destroyed with wonderful rapidity. The most destructive period in this respect was probably that of the immigration of the Slavonic pastoral tribes, who only very slowly settled down to arable agriculture. The last catastrophe of this kind was the war of independence in the twenties of the present century. In the plains and in the highlands above 2000 feet, the destruction of soil is not so rapid, but neither in plains nor highlands are the conditions very favourable. In the plains, owing to the destruction of the forests, the rains are more irregular, the supply of moisture less ample, and the rivers more torrential, in consequence of which large areas have become covered with stony detritus. In the mountains, again, though the rains are more frequent even in summer, and in winter there is a covering of snow for a longer or shorter period, still the violence of the rains, the recurrence of long periods of drought, the prevalence at these elevations of limestone rock, and the ubiquitousness of the goat, are all against the restoration of forests once destroyed. The recovery of the soil thus lost is, according to Dr. Philippson, not to be thought of. All the more urgent is the necessity for regulation of the forests and maquis so as to avert further loss.

AFRICA.

An Expedition to the Barotse Country.—Captain Alfred Bertrand, who is a Fellow of our Society, as well as of the Paris and Geneva societies, furnishes the following brief account of an expedition to the Barotse country, under the leadership of Mr. Percy C. Reid, in which he took part: "Our object was to reach the source of the Majili river, an important tributary of the left bank of the Zambezi which had not yet been explored. We left England in March, 1895, and reached Mafeking railway terminus on April 17. Our party consisted of Mr. Percy C. Reid, Mr. Pirie, Captain Gibbons, and myself. We left Mafeking on April 22, and

reached the Zambezi on June 24. Having left our waggons, bullocks, and half the saddle-horses to await our return at Gazuma Veey, where the grass is comparatively good, we crossed the Zambezi at the junction of the Chobe river (called Linyauti or Kuendo by the natives), and reached Kazungula. Captain Gibbons left us here to go to Lialui by water. Our direction was nearly due north, and we had not left the Zambezi for a fortnight before all our saddle-horses had disappeared, including two slaughtered by lions, and we were, therefore, obliged for the future to walk during the whole time. We ascended the Majili river, and reached its source (latitude = 16° 9′ 1″, altitude = 3650 feet) on July 31. Here we were on the watershed of the Zambezi and the Kafukwe river. Since we left Mafeking, Reid had taken over seventy astronomical observations for latitude in forty different positions; I helped him in reading the chronometer when he was using the sextant. Having attained our object, Reid and Pirie decided to return to Kazungula and go along the Chobe river. I decided to walk across the Barotse country as far as Lialui, the residence of King Lewanika; we were to meet later on at Kazungula. At this latitude, the part of the Barotse country lying between the Majili river and the Lumbi river is not known. It is composed of a succession of generally wooded hills intersected by valleys, where flow the tributaries of the three big rivers, Majili, Nzoko, and Lumbi, which run into the Zambezi. On reaching the river Lumbi, I crossed the 'track' which is followed by the missionaries when they go by land to Lialui. The character of the country is different; the hills are not so near each other, and the rivers are less numerous; the most important are the Motondo and the Lui, which unite further southwards and run into the Zambezi. Here and there some large lagoons are to be found, some of them communicating with the Zambezi. After arriving at Lialui, I was very kindly welcomed by the missionaries and by the King Lewanika, who is now under the influence of Christianity. Lewanika, a clever man, gave me interesting particulars about the unknown northern border of his kingdom and its inhabitants. After staying several weeks at Lialui, where I worked as hard as I could, and where I was able to collect much about the Barotse country, Lewanika hired me three native canoes, and I went *viâ* the Zambezi to Kazungula in seventeen days, visiting Nalolo, Sesheke, etc., and going through the splendid region of the rapids between Sesma and Katima-Molilo. As agreed, I met Reid and Pirie at Kazungula, whence we returned by Buluwayo."

Journey to Lake Rukwa.—The account of a journey made by Mr. W. H. Nutt, from Fwambo, the London Missionary Society's station south-east of Lake Tanganyika, to Lake Rukwa (or Rikwa, as Mr. Nutt prefers to spell it), has appeared in the *British Central Africa Gazette* for October 15 and November 1, 1895. In this journey (made about the middle of 1894) the route led north-east through the eastern highlands of Fipa, and struck the lake at some distance from the south end, reached by Sir H. H. Johnston and Dr. Cross in 1889. It thus throws some new light on the imperfectly known hydrography of the lake, and on the features of the surrounding country. Passing at first through a stretch of thin forest, broken occasionally by the rocky beds of wooded streamlets, Mr. Nutt soon reached a more rugged and mountainous country, cut by wild ravines, with ranges running north and south, separated by streamlets flowing to the Saisi, the main feeder of Lake Rukwa from the south-west. Many ruined villages destroyed by the slave-raider Kimaraunga (since driven into his own country by Wissmann) were passed, but near the edge of the plateau small hamlets perched on the hillsides, with a small amount of cultivated ground, were seen. A descent of 1200 feet led from the higher Fipa plateau, but another range of hills had to be crossed before the latter was finally left. From the top of Mount Nakitumbe, some 7000

feet high, a view was obtained over the Rukwa plain and the mountainous country to the north and south, Mount Memya being the most prominent peak in the former direction. A descent of 3000 feet from the normal plateau-level led to the plain, the slopes (down which a foaming torrent descended) producing some of the best African timbers, and swarming with monkeys. The party now struck northwards, following the base of the plateau along a perfectly straight road 6 feet wide made by Kimaraunga when in power here. Since his defeat, the Asukuma have returned to their homes from which he had expelled them. The absence of water and villages to the north-east obliged the traveller to retrace his steps, and a route southwards slightly nearer the lake than that previously followed was chosen. The inhabitants were in a state of great want, the locust plague having passed over their country. The description given of the plain recalls that of its southern portion visited by Johnston. It was a heated level of black fœtid mud baked firm and dry at the time, but inundated during the rains. The Saisi river was crossed, and the Uwanda country entered. The villages are chiefly along the river, in which fishing is carried on by means of weirs and fish-baskets. To the south of the river game abounds, though absent to the north. The lake was reached after a fringe of sedge-grass, coated with an alkaline deposit, had been crossed, which, however, did not reach quite to the water. The immediate shore was absolutely flat and straight, without a single bay, or any bank of stones or sand. The lake, which Mr. Nutt likens to a gigantic mud-hole, is very shallow for some distance from the shore. It is reported to be shrinking from the north and south, and apparently receives few considerable rivers, so that the great evaporation caused by the fierce sun may well exceed the supply of water. The eastern range comes nearer the shore than the western, and Mounts Kiumba and Ilonga, near its south end, presented a broken and romantic appearance. It ends abruptly northwards in Mount Mbutwe. Large flocks of water-fowl were seen, and hippopotamus, crocodiles, and rhinoceros are said to abound. As it proved impossible to proceed southwards, the return was made in the main up the Saisi valley, and the second half of the route cannot have deviated far from that of Sir H. H. Johnston, keeping, however, apparently slightly more to the north, over the southern end of the Fipa plateau, the ascent to which (2400 feet) was made by an easier path than that previously used in the descent.

MM. Nilis and de la Kéthulle on the Borders of Darfur.—Additional information on the country traversed by these explorers (*ante*, p. 203) is given both in the *Bulletin* of the Royal Belgian Geographical Society (1895, No. 6), and in the *Mouvement Geographique* (1896, Nos. 2, 4, 6). The rivers Kotto, Bali, and Shinko have all of them deep and rapid streams, but their upper course is broken by rapids. They flow through a grass-covered plain, dotted over with gentle eminences, and abounding in game, especially elephants. The principal tribes of this region are the Sakkaras, south of 6° N. lat.; the Azandes, or Niam-Niam, east of the Shinko and its tributary the Barrango; and the Bandas, north of 6° and west of the last-named river. One of the many sections of the Azande is that of the Banjias, who are above the middle height, are keen hunters and not cannibals, and very clever in manufacturing pottery and articles in wood and ivory. On the upper Shinko the country completely changed, the river flowing through a rocky mountainous region, connected with the mountain-knot whence spring the Kotto, the Shari, and the Bahr-el-fertit. Some of the ridges rose 1600 to 1900 feet above the level of the plain. The head-streams of the Bali and Kotto having likewise been crossed, the Nile-Congo watershed was reached; and at Katuaka, on the river Ada, in 8° 50′ N. lat., a colony of Darfur people, who had retired towards the south before the Mahdist bands, by which the country to the north is harassed,

was met with. The banks of the Ada were inundated at the time for some distance, and this prevented the travellers from crossing the stream—perhaps a fortunate circumstance, as they afterwards learnt that one of the marauding bands, several thousands strong, had been on the further side at the time. They were thus prevented from visiting the celebrated copper-mines of Hofra-en-Nahas (reached by Colonel Purdy from the north), north-east of which rich iron-mines are likewise reported. The copper is extracted in simple clay furnaces, and round the vein which is worked, great numbers of old abandoned wells are to be seen. The Banda tribes, who inhabit all the region between 6° and 9° N. lat., seem to have inhabited the region from time immemorial, but they are being gradually pushed southwards by pressure from the north. They all speak the same language and follow the same customs, but have no national cohesion among themselves. The population is sparse, the country having suffered much, like other parts of the Sudan, at the hands of the notorious Rabah. The Bandas show much preference for European goods, and are frequently visited by native merchants coming from the north, both from Darfur and the neighbourhood of Lake Chad. A distinct change in the flora was noticeable in the most northern districts visited, the parallel of 6° N. lat. apparently forming the approximate line of partition. North of this the banana and elaïs palm become rare, while gum-acacias begin to appear. The fauna is abundant, and giraffes, rhinoceros, and ostriches are met with on the watershed by travellers from the south. Horses and cattle are also seen north of the same line. The following positions were determined astronomically by Lieut. de la Kéthulle:—

	Latitude N.	Longitude E.
Village of Sango	5° 59′ 26″	24° 28′ 0″
„ Bandassi ...	7° 6′ 36″	24° 32′ 22″
„ Katuaka	8° 45′ 51″	24° 16′ 32″
„ Yangu	6° 2′ 50″	24° 28′ 31″

Kilimanjaro—Meteorology.—Herr Dr. Wildenmann gives (*Mitt. aus den Deutschen Schutzgebieten*, Band viii. Heft 4) a year's observation of rainfall, rainy days, wind, and mean temperature at Moshi (altitude 3770 feet) on Kilimanjaro; attached is a thorough study of the climatology of the mountain. Malarial fever is not at all unusual, and appears to be sometimes due to the clearing of virgin soil; dysentery is very common, probably from the bad drinking-water, and bronchial catarrh is frequent. The author does not consider colonization possible (it must be remembered that the altitude is nearly that of the Shire highlands), and points out that almost every useful plant can be quite as well grown in Usambara. The mean annual temperature was 70° Fahr., the difference between warmest and coldest months about 42° Fahr., and the mean relative humidity of the atmosphere was 66 per cent. There is also a discussion of the effect of the mountain on the rainfall, and particularly in forming the clouds which usually hang upon the upper slopes. This, as well as the hot rainy climate, is against the formation of a sanatorium at this altitude.

Usambara—Ethnology.—Herr Lieut. Storch (*Mitt. aus den Deutschen Schutzgebieten*, Band viii. Heft 4) gives an account of the customs of the Wakilindi, Washambaa, Wapare, Wambuga, and other tribes. The laws, *i.e.* penalties for murder, theft, etc., are detailed; land-tenure, sorcery, slavery, and religion of each of these tribes are treated separately. The Washambaa worship a deity, the spirits of their ancestors and devils. Pythons are considered sacred amongst the Wapare, as are cats amongst apparently all these tribes. The price of a wife varies from three cattle and four goats to one of each. There is also a short vocabulary of Kimbugu. The information is concisely arranged and carefully worked out.

Algeria, Tunis—Influence of Drought on Vegetation.—M. Edmond Gain was instructed to visit Algeria and Tunis in order to investigate this question. His report (*Nouvelles Archives des Missions Scientifiques*, tome vi. pp. 399–423) contains the author's itinerary (Biskra Sfax and Gabes); he suggests the cultivation of the indigenous species of Medicago. He also remarks that the future of Tunis will depend upon its relations with Rhadames and the Sudan.

AUSTRALASIA AND POLYNESIA.

Mount Kinabalu, North Borneo.—Mount Kinabalu, or the "Chinese Widow," is one of the most prominent features on the west coast of British North Borneo. Between 20 and 30 miles from the sea it rises precipitously to 13,698 feet, according to Sir Edward Belcher's triangulation, and so is the loftiest mountain in Malaya. The summit, of eruptive (?) granite, is 2 miles long, bounded by almost vertical walls, save for two ridges, one of which runs to the north-north-east, 10,000 to 11,000 feet high, precipitous, and almost inaccessible, and probably also granitic like the summit itself; and the other in the same line stretches to the south-south-west for many miles, and is composed of sandstone and hard black shale. This latter spur is not so high as the northern one, the height rapidly falling from 11,000 to 8000 feet, and, once clear of the main mountain, the ridge never exceeds 7000 feet, while the Tambunan pass, 30 miles to the north-west, is only 4700 feet. Many spurs stretch from this main spur to the westward, and divide the many streams that join to form the Tampassuk, as their united waters are called in the plains; and the last of this spur is drained by the Sungut. A short account of Dr. Haviland's expedition to Mount Kinabalu in March and April, 1892, has recently been published.* Dr. Haviland was then curator of the museum at Kuching, Sarawak, and his visit to the mountain is of special interest from a botanical point of view. Landing at Gaya, 30 miles from the mountain, he made his way to the mouth of the Tawaran, up which he travelled, and, keeping due east, crossed a ridge rising to 2700 feet between this stream and a tributary from the north, and descended to the Tawaran, which he crossed at 1500 feet to the village of Bongol. This village stands amid pastures grazed by the buffalo, with Pinang palms and coconut trees around. Crossing the ridge to the east at 3100 feet, Dr. Haviland reached the Tampassuk by a steep descent, crossed it at 1500 feet, and followed the east bank to Koung, a village at the foot of the spurs. To the north of Koung is the conical peak of Saduk Saduk, and beyond it the watershed running to the Maripari spur of Kinabalu, between the Pentagaran (Pantaran) and the Kinitaki. The latter river drains some of the precipices of the great mountain, and joins the Dahombang, which receives on the left the Penokok and its tributary the Haiahaia, all of which drain parts of the south-western ridge of Kinabalu and the spurs on the west of it. These rivers join the Kadamaian with a small branch, the Kalupis, in the same valley south-west of Saduk Saduk, the united stream flowing across the plains being called the Tampassuk. The Kadamaian comes from the top of Kinabalu, down the southern slopes to the west of the south-south-western ridge. From Koung Dr. Haviland followed the Tampassuk and the Kadamaian to 2000 feet, climbed 1000 feet to the village of Kiau, and then to the top of the ridge between the Kadamaian and the Penokok (3500 feet), whence a fine view of the precipices of Kinabalu was obtained. He returned to the valley and followed the Kadamaian over very rough ground to 3200 feet, and, keeping eastwards, climbed the now accessible southern slope to

* "On the Flora of Mount Kinabalu, in North Borneo." By O. Stapf, PH.D. *Trans. Linnæan Soc. Lond.*, Dec., 1894, 2nd ser. Botany, vol. iv. part 2, pp. 69–263.

5000 feet, where he camped for a week in the shelter of an overhanging rock. On the road up a magnificent cascade was seen, formed by the Kadamaian rushing down the ridge, 1500 feet of fall being almost perpendicular. The next camp was the same as Mr. Whitehead's at Temburungo, 7750 feet, and the southern spur of Kinabalu was followed further to Pakapaka, where a small cave sheltered the party at 10,450 feet. Only once was 12,000 feet reached. The climate of Kinabalu is equable, but wet even in the driest month. The mornings are usually clear, save for mist low in the valleys, but by nine o'clock a cloud gathers round the mountain, and is as low as 5000 feet by noon. Rain pours, and sometimes hail and sleet, so that the mountain torrents are in high flood; but late in the evening it ceases, and the beds of the torrents are dry before morning. Frosts may occur on the summit, but snow has never been observed. This daily cloud screens the plants from the sun except for the three early morning hours, so that in the west, where the shadow of the mountain then falls, there is practically no insolation. The diffused light, the equable temperature, and the excessive humidity doubtless explain most of the biological peculiarities of the flora, the absence of deeply divided leaves, the scarcity of brilliant flowers, and their prevalent colours of white and red, as well as the large proportion of fleshy fruits. Dr. Stapf, who has studied Dr. Haviland's collections of plants as well as all previous ones from Kinabalu, gives a full description of the specimens, and divides the hill into four floral zones: (1) the zone of plains and low hills, to 3000 feet; (2) the lower mountain zone, from 3000 to 6000 feet; (3) the upper mountain zone, from 6000 to 10,500 feet; and (4) the summit zone above that level. The peculiarities of the flora increase as the mountain is climbed, and the species of the plants found at higher elevations point to a very different distribution of land and water from that existing at present. The conclusions Dr. Stapf draws, based on botanical evidence alone, bear out the theory of the ancient continental nature of South-Eastern Asia and Australia at a period not later than earliest Tertiary times. This was followed by the separation, first of Austral Malaya, then of the Philippines, then of Malaya from Asia, the submergence of Malaya until Borneo and other islands became archipelagos, and a subsequent elevation leading to the formation of the present islands. It is impossible, in a brief notice, to take up all the points raised in Dr. Stapf's important paper, which is well worthy of study.

New Guinea.—The second number of *Petermann's Mitteilungen*, 1895, gives an account of Herr Otto Ehlers' unfortunate expedition across the south-eastern peninsula of the island. It is the first crossing of the island that has been accomplished since 1873, when A. B. Meyer crossed the narrow isthmus between McCluer gulf and Geelvink bay, but has led to no geographical results owing to its disastrous issue. The expedition started from the mouth of the Francisco river, just south of 7° S. on Huron gulf at the east end of the island, under the leadership of Herr Otto Ehlers and M. Piering. It was apparently inadequately equipped, and at the end of two months the provisions were exhausted, and the members of the expedition found themselves in an uninhabited forest, in which apparently not even game was to be met with. At last a considerable river flowing southwards (probably the Arubada) was struck, and the leaders, in order to gain the south coast as quickly as possible, determined to descend it on a raft. Six of the forty-three carriers of the expedition refused to risk themselves on this craft when constructed, and their fears were justified by the event. The raft was somehow destroyed in the current, when the two leaders and twenty-one of the bearers were drowned, and all the collections and notes which they had made were lost along with the entire remaining equipment of the expedition. The sixteen survivors followed the course of the river, and ultimately fell in with some members of a southern tribe who

conducted them to the mission station of Motu-Motu, on the south coast (in 146° 10′ E., about 110 miles in a direct line north-west of New Guinea). The death of Herr Ehlers is a great loss to exploration; he had done excellent work both in Africa and in Eastern Asia. Baron F. von Mueller is said to be planning the despatch of an expedition from Motu Motu into the interior in the reverse direction. That from the north coast, under Messrs. Tappenbeck, Lauterbach, and Kersten, was to start at the end of March.

Dutch New Guinea.—During a reconnaissance along the south coast of New Guinea, made in 1894 by Lieut. H. Velthuyzen of the Dutch navy, the mouth of a large stream named Devinka was discovered, having a breadth of over 1500 yards, and a depth of 3 feet. Although bad weather prevented its exploration, the Dutch commander thinks that the stream should be accessible to light-draught steamers at all times of the year. A survey was also made of the imperfectly known south coast from Prince Henry island to the British boundary (*Petermann's Mitteilungen*, 1895, No. xi.; from the *Jaarboek van de Kon. Nederl. Zeemacht*, 1893–4, pp. 428–452).

The Name Dyak (Dayak).—Mr. H. Ling Roth, in his forthcoming work on 'The Natives of Sarawak and British North Borneo,' dwells at some length on the misuse and the origin of this name. The first known use of the word by a European is in 1780, by Radermacher, who uses it, however, in such a way as to lead to the inference that it was then commonly known in Batavia and the Dutch Indies generally. It came to be applied by Europeans, misled by the somewhat indiscriminate use of the name by the Malays, to all the wild people of Borneo, although, says Sir James Brooke, "the name properly is only applicable to one particular class inhabiting parts of the north-western coast and the mountains of the interior." The present Rajah of Sarawak writes that, while the numerous tribes in the interior of Rejang are called Kayan, "our own more immediate people" are called "*Daya*, or, as more generally known, *Dyak*." Mr. A. Hart Everett states that several tribes use it as the distinctive appellation of their people, and urges that the name should be confined to these, and that a distinguishing prefix should be added in the case of each tribe. Sir James Brooke seems to have been the first to speak of Sea and Land Dyaks, and Mr. Ling Roth adds the curious fact that the Sea Dyaks, who, since the advent of the Europeans, have settled on the Rejang river, have adopted from the Kayans, the original inhabitants of that river, the designation Ivan, or rather, in Dyak pronunciation, Iban. Various interpretations have been given of the name Dyak. The present Rajah of Sarawak states that *Dyak*, or more properly *Dya*, means in many dialects "inland," and this fact may have contributed to the misuse of the word by Europeans; but it would appear to be more probable that the present use of the name is derived from a misunderstanding of the word *dayah*, which in the language of Sarawak (which is in the heart of the Land Dyak country) means "man." Dr. Meyer has pointed out that the terminal *k* is without significance, and Mr. Ling Roth draws attention to the fact that in numerous compound names (like our cabman, boatman, highwayman, etc.) the term *dayah*, as a prefix, however, is used as a generic term for man, as in *dayah berdagang*, "merchant," *dayah takap*, "prisoner," etc. Probably, Mr. Roth thinks, the Malays first, and the Europeans after them, misapprehended this generic term, and applied it as a collective name in a way not known to the people whom they so called.

Fergusson Island, British New Guinea.—Sir Wm. Macgregor, in his last report, states that he has made an expedition across this island from Hughes to Seymour bay (24 miles). He found that the interior is mainly forest, with, however,

patches of rich alluvium. The rocks were for the most part volcanic; three or four small creeks from the foot of Mount Edagwaba "would probably be found to contain gold." Curious ridges apparently of obsidian or pitchstone were noticed near a hill, Bulina (1500 to 1800 feet high). Collections of skulls were found in several of the inland villages, and amongst these was an upper mandible of the hornbill, which does not seem to visit the island, though on the mainland its head is a badge corresponding to the Victoria Cross. The people were on the whole friendly. The climate appeared healthy, and no swamps were noticed.

POLAR REGIONS.

Dr. Nansen's North Polar Expedition.—No further light has, during the past month, been thrown on the rumour with respect to Nansen's Expedition. We are still awaiting information as to the origin of the news which was telegraphed; at present we cannot trace it beyond M. Kandakoff and Kolymsk. Captain Wiggins proposes that a search expedition should be sent by land to Cape Chelyuskin, on the chance of finding any message which may have been left there by the expedition; and another by sea to the New Siberian islands, to discover if Nansen had called there, or if any trace can be found of his return. Baron Toll maintains that the land expedition is impracticable. No harm would be done by sending a vessel into the sea to the north of Siberia to find if there is any trace of the ship, but a formidable search or relief expedition at this stage is unnecessary. If there is any real foundation for the rumour that the expedition has returned, we are sure to receive definite information during the summer. Dr. Nansen promised a friend in London that if he touched at the Siberian coast at all, he would send a communication; as no communication has arrived, the conclusion is that the *Fram* in all probability did not touch the coast.

GENERAL.

Anthropology.—An extremely valuable and learned treatise by Professor Keane will be of great use to English anthropologists who are at present without a satisfactory text-book ('Ethnology:' Cambridge University Press, 1896). The subject is treated in a most liberal manner; the various chapters on man's place in nature, his original habitat, the Ice age and primitive culture, are in reality monographs of these branches of anthropology, in which a mass of detailed information is clearly and concisely discussed. Language and the physical criteria of race are exhaustively treated, and the author, after reviewing other classifications of man, divides the human species into four main groups which are practically those of Linnæus. Each group is discussed in a special chapter with a genealogical tree and photographic reproductions of the more important types. There are also many other illustrations of skulls, dolmens, palæolithic and neolithic implements. As a sound introduction to ethnology, the work will be extremely valuable to all travellers and residents in savage places, as it is both compact, full of details, and yet, strangely enough, extremely readable. The pedigrees of the various groups, *Homo caucasicus*, etc., will be vigorously criticized, but they undoubtedly assist in giving a clear idea of race distribution. It appears somewhat rash to say that "without miscegenation" (with yellow races) "the negro has no future," though, of course, few will deny that he cannot or has not advanced without extraneous aid. There are other somewhat startling ideas of a similar nature, but gratitude in the possession of such a mine of information, carefully and clearly treated, much outweighs all other considerations, and this book will probably become a standard English classic on the subject.

Geography in Education.—No. 1, Vol. xxvii. (1895) of the Bulletin of the *American Geographical Society* contains an abstract, by Mr. Israel C. Russell, of the University of Michigan, of the reports of a conference on geography held at Chicago in December, 1892. The conference was organized by a "committee of ten," appointed by the National Education Association in that year to consider the general subject of uniformity in school programmes and in requirements for admission to college, the members taking part in the conference being ten representatives (of whom Mr. Russell was one) selected from instructors in schools and colleges. The reports were first published by the U.S. Bureau of Education (Washington, D.C., 1893), and afterwards for the National Educational Association by the American Book Company under the title of 'Report of the Committee of Ten on Secondary School Studies,' with the Reports of the Conferences arranged by the Committee (New York, 1894). On Geography, two reports are published, a minority report having been sent in by one of the members of the conference. The members signing the majority report, without apparently making any attempt to define geography, direct special attention to five phases of the subject which they designate respectively as elementary geography, physical geography, physiography, meteorology, and geology. These they define partly with reference to the stage of school or college teaching to which they correspond. Physiography, for example, is distinguished from physical geography as "a more advanced treatment of our physical environment . . . to be pursued in the later high school or early college years." This, however, is one of the points to which the minority report takes exception, objecting to the use of the term physiography altogether on account of the indefiniteness of the word as now used by various authors. The majority report also urges strongly upon teachers the importance of using geography as a means of developing three classes of mental activities: the power to observe, the power of scientific imagination, and the power of reasoning; and, with reference to the cultivation of these faculties, treats of the whole subject of geographical teaching under four aspects: (1) Observational geography (what is commonly known as *Heimatskunde*); (2) representative geography (teaching the use of sketches, maps, models, etc.); (3) descriptive geography; and (4) rational geography—under which head attention is principally directed to the changes wrought in a landscape by forces acting through long ranges of time. Great stress is laid on the importance of placing good topographical maps in the hands of students, and, with a view to this, the conference appointed a committee to consider in what way the maps issued by various government and state surveys might be made available for school use. The result was the publication of a report by this committee on 'The Use of Government Maps in Schools' (New York: Henry Holt & Co., price 34 cents), in which descriptions are given of over fifty phases of relief that are well illustrated by maps which can be had by teachers, either free of charge or for a nominal sum. Outlines of methods of instruction in various grades are suggested. A good deal of space is taken up with illustrations of the scope of physiography as understood by the writers of the report, and it is contended that a comparison of the outline given under this head with the table of contents in the "classic works on geography by Ritter, Humboldt, and Guyot," shows that "a new element has been introduced into the science by the modern school. Rational geography has supplanted mere description."

Spelæological Society.—Last year a new scientific society was formed in Paris for the study of a branch of geography which has recently been greatly advanced by M. E. A. Martel, the general secretary of the new association. The Bulletin of the Society, issued quarterly, is called *Spelunca*. The first article of the statutes thus defines the objects pursued: "The Spelæological

Society has been founded in order to ensure the exploration, to facilitate the general study, and to aid in the regulation or utilization of all kinds of subterranean cavities, known or unknown, natural or artificial; to encourage and give grants towards investigations bearing in any way on caverns; and to popularize and develop researches of every kind into the interior of the Earth from the practical as well as the theoretical, the utilitarian as well as the scientific, standpoints." Incidentally, it is interesting to notice that this scientific society is licensed by the police, has to announce each meeting to the police, and is under penalty to discuss at its meetings spelæology alone.

The Ivory Trade in 1895.—The *Mouvement Géographique* (1896, No. 2) again publishes an annual summary of the ivory trade (cf. *Journal*, vol. v. p. 273), from which it appears that the importance of Antwerp as a market for this article goes on increasing, while the quantities sold in London and Liverpool show a further decline in 1895, as compared with the previous year. Excluding old stock on hand, the amounts offered for sale were respectively 268, 263, and 53 tons, although, including old stock, London still stood at the head of the list. As regards the place of origin, the amount exported from the Congo State reached in 1895 the largest figure on record, far exceeding that from any other part of Africa, and appears to include some from the Sudan, which can no longer reach Egypt. The amount from the East Coast has again diminished, the death of Mr. Stokes having added another cause of decrease to those previously in operation.

Captain Cook's Earliest Monument.—Sir Erasmus Ommanney calls our attention to an article by Mr. W. H. Traill in the *Brisbane Courier* for January 3 last, giving an account of the first monument erected in honour of Captain Cook, which, strange to say, was not in his own country, but in France, and has apparently escaped the notice of his biographers. It was erected, from the designs of M. Pajou, by M. de Laborde (afterwards a victim of the French Revolution), who showed a warm appreciation of the merits of the English navigator, in his park of Mereville, where also exists a monument to the memory of M. de Laborde's two sons, who lost their lives when taking part in the voyage of La Pérouse in 1786, or eight years after the death of Cook.

The Geography of Mammals. No. IV.—In this paper, in the March number, pp. 282, 283, the tropic of *Capricorn* has by inadvertence been named instead of the tropic of *Cancer*.

OBITUARY.

Cristoforo Negri.

Cavaliere Cristoforo Negri, whose death was recently announced, was a distinguished Italian scientist and Minister of State, and for many years the most enthusiastic promoter of geographical research that Italy has seen. Born at Padua in 1809, he first devoted himself to the study of law at Pavia, Gratz, and Vienna. For seven years he held the post of Professor of Constitutional Law at Padua, but, owing to the prominent part he took in the political movements of 1848, he was compelled to leave that city and remove to Turin, where he soon attained the dignity of Rector of the University. He was subsequently appointed chief of the Consular Department in the Italian Ministry of Foreign Affairs, and in the course of his official duties visited England, Russia, and other countries, where his reputation and popularity won him a large circle of friends and admirers. He was the founder, in 1866, and first President of the Italian Geographical Society, the

meetings of which were first held in Florence, and then transferred to Rome. This body, under Negri's auspices, granted aid to the German Polar expedition and to the Italian expedition to Southern Africa, and amongst the recipients of its gold medals was Colonel, afterwards Sir Henry, Yule. It was through Negri's representation and influence that Lieut. Eugenio Parent, of the Italian navy, was attached to the Swedish Arctic expedition of 1872, and Lieut. Giacomo Bove to Professor Nordenskiold's expedition in quest of the North-East Passage. Cavaliere Negri was also a strong supporter of Antarctic exploration, and, indeed, most of the foremost geographical undertakings of the day. He had for many years been an Honorary Corresponding Member of the Royal Geographical Society.

MEETINGS OF THE ROYAL GEOGRAPHICAL SOCIETY, SESSION 1895-96.

Seventh Ordinary Meeting, February 24, 1896.—CLEMENTS R. MARKHAM, ESQ., C.B., President, in the Chair.

ELECTIONS.—*Louis Charles Alexander, LL.D.; Alfred Davidson Asgill; Hon. David Wynford Carnegie; W. A. L. Fletcher; William Harris; John McCleeland Henderson, Ph.D.; Lionel F. Leveaux; Lieut.-Colonel G. E. Money; Arthur Llewellyn Pearse; Charles Woolley.*

The PRESIDENT said: Before commencing the business of the evening, I must allude to the news lately received about Nansen's expedition. In answer to a telegram, Mr. Gregoriev, the Secretary of the Imperial Russian Geographical Society, has written me a letter, in which he states that when the telegram arrived from Irkutsk at St. Petersburg, the governor-general of Eastern Siberia, General Gorunzkine, happened to be there. He said that Kuchnaroff, mentioned in the telegram, was a merchant of Yakutsk, trading in the Kolyma district, and that Kondakoff, also mentioned, is the head of the Kolyma government. The governor-general did not believe the news to be true, because, if it had been, Kondakoff would certainly have sent it to the governor of Yakutsk, who would at once have telegraphed to General Gorunzkine. On February 14, the governor-general sent a telegram to the governor of Yakutsk, but the telegraph line ends at Kirinsk, whence the post takes twelve days to go to Yakutsk, and twelve days back. Mr. Gregoriev also telegraphed for a *verbatim* account of what appeared in the local newspaper, *Vostochnoe Obosrinie*. The governor-general does not believe the news, nor do Baron Osten Saken nor Mr. Gregoriev. A reply from Yakutsk may be expected about March 10; meanwhile, we can only hope to have some news of Nansen, and of his gallant companions, and trust that they are quite safe, this being their third winter.

We have also received a letter from Colonel Trotter, a member of our Council, now serving on the Joint Commission for the delimitation of the colony of Sierra Leone. Colonel Trotter reports that he has reached the source of the Niger, a spring from which a small stream issues. He gives an interesting account of the scenery, and I trust, when he returns, we shall have a paper from him. I heard another interesting piece of news this afternoon from Admiral Wharton, viz. that one of his surveying ships has obtained the deepest sea-sounding ever made. The deepest ever made before was by the *Tuscarora*, 4675 fathoms, near Japan; but the *Penguin* has made a sounding much deeper near the Tonga island. Before calling upon Mr. Littledale, I must refer to the great loss the Society has sustained in the death of that illustrious geographer, General James Walker. In the Council his loss will be much felt, and will for a long time be irreparable. He will be spec'ally missed on

such an occasion as the present, for his profound knowledge of the geography of Central Asia was always at our service. On his public services, and on his high scientific attainments, I will not dwell here; it has been my duty to do so in our *Journal*, but I could not allow this opportunity to pass without referring to the loss this Society has sustained by the death of our lamented friend. I have also to announce the death of Signor Cristoforo Negri, founder of the Italian Geographical Society, who was very active as a geographer thirty years ago, and is well known to those who can remember that time. We have also lost the Rev. Horace Waller, a companion of Livingstone in the Zambesi region, who so frequently joined in our discussions, and gave us much interesting information when papers regarding that part of the world were read.

The Paper read was:—

"A Journey across Tibet from North to South." By St. George R. Littledale, Esq.

Eighth Ordinary Meeting, March 9, 1896.—CLEMENTS R. MARKHAM, ESQ., C.B., President, in the Chair.

ELECTIONS.—*Ford Gurney Barclay; Lord Castleton; Charles Grugeon; Count Ernest Hoyos; Count Stanislas Ostrórog; George Stewart; Philip Vander Byl.*

The PRESIDENT said: A very important journey has recently been made from China to Assam by Prince Henry of Orléans, and two companions, and I am glad to say that His Royal Highness has almost promised to read us a paper, and give us an account of his very remarkable journey on one of the Mondays in April. We have also had news of a geographical feat having been performed in the Barotse country, in Africa, when several of the upper feeders of the Zambesi have been crossed by Mr. Reid and Captains Gibbons and Bertrand. They have done exceedingly good work, and mapped the country. Turning to domestic matters, the Council has been anxious to make the council-room more pleasant for Fellows who desire to come to read and make researches; they have ordered a fire to be always lighted, have shortened the table, and sanctioned the purchase of two very comfortable armchairs.

The Paper read was:—

"On the Country of the Shans." By Colonel R. G. Woodthorpe, C.B., R.E.

Afternoon Technical Meeting, Friday, March 9, 1896.—CLEMENTS R. MARKHAM, Esq., C.B., F.R.S., President, in the Chair.

The Paper read was:—

"A Plan for the Geographical Description of the British Islands on the Basis of the Ordnance Survey." By Hugh Robert Mill, D.SC., F.R.S.E.

GEOGRAPHICAL LITERATURE OF THE MONTH.

Additions to the Library.

By HUGH ROBERT MILL, D.Sc., *Librarian*, R.G.S.

THE following abbreviations of nouns and the adjectives derived from them are employed to indicate the source of articles from other publications. Geographical names are in each case written in full:—

A. = Academy, Academie, Akademie.
Ann. = Annals, Annales, Annalen.
B. = Bulletin, Bollettino, Boletim.
Com. = Commerce, Commercial.
C. R. = Comptes Rendus.
Erdk. = Erdkunde.
G. = Geography, Geographie, Geografia.
Ges. = Gesellschaft.
I. = Institute, Institution.
J. = Journal.
M. = Mitteilungen.
Mag. = Magazine.
P. = Proceedings.
R. = Royal.
Rev. = Review, Revue, Revista.
S. = Society, Société, Selskab.
Sitzb. = Sitzungsbericht.
T. = Transactions.
V. = Verein.
Verh. = Verhandlungen.
W. = Wissenschaft, and compounds.
Z. = Zeitschrift.

On account of the ambiguity of the words *octavo*, *quarto*, etc., the size of books in the list below is denoted by the length and breadth of the cover in inches to the nearest half-inch. The size of the *Journal* is 10 × 6½.

EUROPE.

Austria—Bosnia and Herzegovina. **Ballif.**

Wasserbauten in Bosnien und der Hercegovina, I. Theil. Meliorationsarbeiten und Cisternen im Karstgebiete. Dargestellt von Philipp Ballif. Herausgegeben von der Bosn.-Herceg. Landesregierung. Wien: A Holzhausen, 1896. Size 11½ × 8, pp. 92. *Maps and Plates. Presented by M. H. Moser.*

The works carried out by the Government of Bosnia-Herzegovina in the way of improving the water-supply in the Karst district are treated in detail in this Report, with a number of large-scale maps beautifully executed. The problem is to distribute water over the surface of a country the natural circulation of which is largely underground. It involves the construction of canals and cisterns, and the "regulation" of springs and sink-holes.

Austria—Bosnia-Herzegovina. **Meteorology.**

Ergebnisse der Meteorologischen Beobachtungen der Landesstationen in Bosnien-Hercegovina im Jahre, 1894. Herausgegeben von der Bosnisch-Hercegovinischen Landesregierung. Wien, 1895. Size 12½ × 9½, pp. xii. and 112. *Map, Diagrams, etc. Presented by M. H. Moser.*

These statistics convey further evidence of the enlightened action of the Bosnia-Herzegovina Government in studying the physical geography of these provinces.

Austria—Geographical Work. *M.G. Ges. Wien* **38** (1895): 674–691. ———

Bericht über die Leistungen der österreichischen Staatsinstitute und Vereine auf dem Gebiete der geographischen und verwandten Wissenschaften im Jahre 1894.

Gives an account of the work of the Military Geographical Institute, the Geological Survey, the Statistical Department of the Ministry of Commerce, the Meteorological and Magnetic Institute, the Scientific Exploration of Bohemia, and the German and Austrian Alpine Club.

Channel Islands. *Le Globe, B.S.G. Genève* **35** (1896): 43–56. **Chaix.**

Les côtes des Iles Normandes de la Manche. Par M. le Prof. Ém. Chaix.

Danube. **Lorenz-Liburnau.**

Donau-Studien. Nach dem Plane und den Instructionen von Dr. Jos. Ritter v. Lorenz-Liburnau. Vierte Abhandlung. Beilage zu Band xxxviii. (1895) der M. G. Ges. Wien. Vienna, 1895. Size 9 × 6¼, pp. iv. and 116.

This section deals with the rate of the current in the Danube between Passau and Galatz, by comparing the speed of steamers going up and down stream.

Færoes. **Grossmann.**

The Færoes. By Karl Grossmann, M.D. From the *Geographical Journal* for January, 1896. Size 10 × 6½, pp. 24. *Map and Illustrations.*

France. *B. Union G. Nord de la France* **15** (1894): 216–240; **16** (1895): 1–64. **Gilles.**

Le bassin houiller du Nord et du Pas-de-Calais. Par M. Gilles.

France—Gard. *Spelunca* **1** (1895): 87–97. **Mazauric.**

Les cavernes de la Boudène au Mas Cabanis, commune de Roquedur (Gard). Par M. Félix Mazauric à Nîmes. *With Plans.*

France—Jura. *Spelunca* **1** (1895): 115–128. **Chevrot and Corcelle.**

Première exploration du Gouffre de Pierrefeu (Jura). Par M. le Dr. Chevrot. Grottes du Jura méridional (Autour de Culoz). Par M. J. Corcelle. *With Illustrations.*

France—Marseilles. *C.R.* **122** (1896): 209–213. **Vasseur and Fournier.**

Preuves de l'extension sous-marine, au sud de Marseille, du massif ancien des Maures et de l'Esterel. Note de MM. Vasseur, et E. Fournier. *With Map.*

Germany—Norderney. **Verhoeff.**

Nova Acta K. Leop.-Carol. Deutschen A. Naturforscher **61** (1894): 45–216.

Blumen und Insekten der Insel Norderney und ihre Wechselbeziehungen, ein Beitrag zur Insekten-Blumenlehre und zur Erkenntniss biologischer und geographischer Erscheinungen auf den deutschen Nordseeinseln. Von C. Verhoeff. *With Plates.*

Germany—Rainfall. **Moldenhauer.**

Die geographische Verteilung der Niederschläge im nordwestlichen Deutschland. Von Dr. Paul Moldenhauer in Kiel.—Forschungen zur deutschen Landes- und Volkskunde . . . herausgegeben von Dr. A. Kirchhoff. Neunter Band. Heft 5. Stuttgart: J. Engelhorn, 1896. Size 9½ × 6½, pp. [68]. *Map.*

Greece. *Z. Ges. Erdk. Berlin* **30** (1895): 417–498. **Philippson.**

Reisen und Forschungen in Nord-Griechenland. Von Dr. Alfred Philippson. II. Teil. *With Map and Profiles.*

Hungary—Huzuls. *Globus* **69** (1896): 69–74, 90–95. **Kaindl.**

Neue Beiträge zur Ethnologie und Volkskunde der Huzulen. Von Dr. Raimund Friedrich Kaindl, Czernowitz. *With Illustrations.*

Italy—Pontine Marshes. **Donat.**

The Pontine Marshes. A lecture delivered at the Geographical Society of Berlin. By F. M. von Donat. Translated from the *Proceedings of the Berlin Geographical Society. With Map.* London: S. Sidders, 1895. Size 8½ × 5½, pp. 16. *Presented by the Author.*

Deals with the methods and results of draining the Pontine marshes, and combating the endemic fever of the district.

Malta. *J.R. Colonial I.* **27** (1896): 176–180. **Bedford.**

Malta and the Maltese Race. By the Rev. W. K. R. Bedford. [Abstract.]

Norway—Anthropology. *Ymer* **14** (1894): 165–186. **Arbo.**

Udsigt over det sydvestlige Norges anthropologiske forhold. Ved Brigadelæge C. O. E. Arbo.

Norway—Varanger Fiord. *Nature* **53** (1896): 417–418. **Reusch.**

The Varangerfjord Region and the Forthcoming Solar Eclipse. By Hans Reusch. *With Illustration.*

Portugal. *B.S.G. Lisboa* **14** (1895): 385–402. **Choffat.**

Promenade au Gerez. Souvenirs d'un géologue. Par Paul Choffat.

Portugal—Historical *B.S.G. Lisbon,* **14** (1895): 741–775. **Dozy.**

Vesperas do Centenario. O cerco de Santarem, 1184. Segundo os documentos Arabes. Por R. Dozy, traducção de Luciano Cordeiro.

Portugal—Oporto. **Menéres.**

Relatorio dos Actos da Direcção da Associação Commercial do Porto no anno de 1895 elaborado pelo 1° Secretario Alfredo da Fonseca Menéres e apresentado á assembleia geral, em sessão de 15 de Janeiro de 1896. Porto: Typ. do "Commercio do Porto," 1896. Size 9 × 6½, pp. 134 and 168. *Presented by the Compiler.*

Russia. *National G. Mag.* **7** (1896): 3–26. **Hubbard.**

Russia in Europe. By Hon. Gardiner G. Hubbard, LL.D. *With Map.*

Russia—Kolgueff Island. **Feilden.**

Notes on the Glacial Geology of Arctic Europe and its Islands. Part I.: Kolguev Island. By Colonel H. W. Feilden. With an Appendix by Prof. T. G. Bonney. [From the *Quarterly Journal of the Geological Society* for February, 1896, vol. lii.] Size 8½ × 5½, pp. [16]. *Presented by Colonel Feilden.*

A paper communicated to the Geological Society.

Servia—Douboca Caves. *Spelunca* **1** (1895): 81–87. **Cvijić.**

La grande grotte de Douboca, dans la Serbie orientale. Par M. le Dr. J. Cvijić. *With Plan.*

Spain. **Wegener.**

Herbsttage in Andalusien. Von Georg Wegener. Zweite Auflage. Berlin: Allgemeiner Verein für Deutsche Litteratur, 1895. Size 9 × 6, pp. 322. *Illustrations.* *Presented by the Publisher.*

A popular description of a visit to Spain and the coast of Morocco, with numerous good illustrations.

Switzerland. ———

Annuaire Statistique de la Suisse. Publié par le Bureau de Statistique du Département Fédéral de l'Intérieur. Cinquième Année, 1895. Bern, 1896. Size 10 × 6½, pp. xviii. and 408.

Turkey—Constantinople. *J.S. Arts* **44** (1896): 351–357. **Davey.**

Stamboul: Old and New. By Richard Davey.

Turkey—Railways. *M.G. Ges. Hamburg* **11** (1896): 41–61. **Heintze.**

Eisenbahnen in der Türkei. Von W. Heintze.

This article gives an account of the railways of the Turkish empire, from which it appears that at present there are 920 miles of railway in European Turkey and 940 miles in Asiatic Turkey.

ASIA.

Armenian Question. *Contemporary Rev.* (1896): 270–276. **Lynch.**

The Armenian Question: Europe or Russia? By H. F. B. Lynch.

Asiatic Turkey, etc. *Petermanns M.* **42** (1896): 1–10. **Selenoy and Seidlitz.**

Die Verbreitung der Armenier in der asiatischen Türkei und in Transkaukasien. Nach General-leutnant G. L. Selenoy und N. v. Seidlitz. *With Map.*

This was noticed in the *Journal* for March, vol. vii. p. 312.

Central Asia. *Scottish G. Mag.* **12** (1896): 75–87. **Obruchef.**

The Orography of Central Asia and its South-Eastern Borderlands. [Abstract from article by M. Obruchef in the *Izvestiya* of the Russian Geographical Society, No. iii., 1895.]

China and France. ———

No. 1615. Chambre des Députés. Sixième Législature. Session extraordinaire de 1895. Projet de Loi portant approbation des Conventions de délimitation et de commerce signées à Pékin, le 20 juin 1895, entre la France et la Chine, présenté . . . par M. Berthelot, et par M. Guieysse. [Paris.] Size 11½ × 9, pp. 14.

China—Mongolia. *Scottish G. Mag.* **12** (1896): 57–68. **Markoff.**

The Towns of Northern Mongolia. By Dr. Anatolius Markoff.

China—Shantung. **Armstrong.**

In a Mule Litter to the Tomb of Confucius. By Alex. Armstrong. London: J. Nisbet & Co., 1896. Size 7½ × 5½, pp. viii. and 148. *Illustrations.* *Price* 2*s.* 6*d.* *Presented by the Publishers.*

A simply written narrative of a missionary's journey in the province of Shantung.

China—Trade. *M.G. Ges. Hamburg* **11** (1896): 80–95. **Markoff.**

Der zukünftige Handel Chinas. Von Dr. Anatol Markoff.

Eastern Asia. **Curzon.**

Problems of the Far East. By the Right Hon. George N. Curzon, M.P. Japan —Korea—China. New and Revised Edition. Westminster: A. Constable & Co., 1896. Size 9 × 6, pp. xxiv. and 444. *Maps and Illustrations.* *Price* 7*s.* 6*d.* *Presented by the Publishers.*

This new edition is revised in the light of the results of the war between China and Japan, but, as the Author points out in his preface, the fact that this war justified his predictions has made the amount of revision requisite comparatively slight.

India. *J. United Service I. India* **24** (1895): 369–391. **Neville.**

Gold Medal Prize Essay for 1895. Six Tactical Problems, with solutions applicable to India (with six Maps). By Lieut.-Colonel J. P. C. Neville.

India. *B. American G.S.* **27** (1895): 360–372. **Wilson.**

Topography and Scenery of Northern India. A Lecture by Herbert M. Wilson.

India—Boundary. **Holdich.**

Preliminary report of the operations of the Survey detachment . . . in connection with the Pamir Boundary Delimitation. From Colonel T. H. Holdich. Size 13½ × 8½, pp. 6. *Presented by the Secretary of State for India.*

India—Himalaya. *M.G. Ges. Wien* **39** (1896): 1–35. **Diener.**

Die Eiszeit im Himalaya. Von Dr. Carl Diener (in Wien).

India—Himalayas. **McCormick.**

An Artist in the Himalayas. By A. D. McCormick. Illustrated by over 100 original sketches made on the journey. London: T. Fisher Unwin, 1895. Size 9 × 6, pp. xii. and 306. *Portrait and Map. Price* 16*s.*

Mr. McCormick accompanied Sir W. M. Conway in his Karakoram journey, and this book gives his impressions by the way in words and sketches.

India—Kashmir. *Alpine J.* **18** (1896): 17–32. **Collie.**

Climbing on the Nunga Parbat Range, Kashmir. By J. Norman Collie. *With Two Illustrations.*

India—Kashmir. *J.E. India Assoc.* **27** (1896): 22–32. **Lawrence.**

Kashmir. By Walter R. Lawrence.

India—Punjab. *J.S. Arts* **44** (1896): 285–304. **Lyall.**

Punjab Irrigation: Ancient and Modern. By Sir James Broadwood Lyall.

India—Punjab—Rawalpindi. ———

Gazetteer of the Rawalpindi District. Revised Edition, 1893–94. Compiled and Published by Authority of the Punjab Government. Lahore, 1895. Size 10 × 7, pp. x., 268, and lx. *Map. Presented by the Secretary of State for India.*

India—Shan Hills. *J.S. Arts* **44** (1896): 197–210. **Woodthorpe.**

The Shan Hills: their Peoples and Products. By Col. R. G. Woodthorpe.

Japan. *Trans. Asiatic S. Japan* **23** (1895): 91–116. **Mac Cauley.**

The Japanese Landscape. By Clay Mac Cauley.

A consideration of Japanese scenery in the light of the geographical, geological, and climatic conditions on the islands, explaining the individual character of it, and analyzing its æsthetic value.

Japan—Meteorology. **Knipping.**

Nova Acta K. Leop.-Carol. Deutschen A. Naturforscher **61** (1894): 217–288.

Die jährliche Periode der mittleren Richtung der Winde, unteren und oberen Luftströmungen in Japan. Von Erwin Knipping. *With Plates.*

Japan—Petroleum. *Trans. Asiatic S. Japan* **23** (1895): 75–90. **Newell.**

The Petroleum Industries at Nagaoka. By Horatio B. Newell.

Japanese Art. **Rein.**

Oesterreichische Monatssch. Orient **20** (1894): 97–102; **21** (1895): 21–31, 121–129.

Fortentwicklung und Wandlungen des japanischen Kunstgewerbes während der letzten zwanzig Jahre. Von J. Rein.

Khiva. *Globus* **69** (1896): 142–145. **Vambéry.**

Bilder aus Chiwa. Von H. Vambéry. *With Illustrations.*

The illustrations include a portrait of the Khan of Khiva and views of the town.

Luchuan Language. **Chamberlain.**

Essay in aid of a Grammar and Dictionary of the Luchuan Language. By Basil Hall Chamberlain. [Published by the Asiatic Society of Japan as a Supplement to vol. xxiii. of its *Transactions.*] Yokohama, etc.: Kelly and Walsh, 1895. Size 9½ × 6, pp. 272. *Presented by the Asiatic Society of Japan.*

Malay Archipelago. **Gennep.**

Bijd. Taal-, Land- en Volkenk. Ned.-Indie (6) **2** (1896): 89–108.

Bijdrage tot de Kennis van den Kangéan-Archipel. Medegedeeld door J. L. van Gennep. *With Map.*

Malay Archipelago—Borneo. **Kühr.**

Bijd. Taal,- Land- en Volkenk. Ned.-Indie (6) **2** (1896): 63–88.

Schetsen uit Borneo's Westerafdeeling. Door E. L. M. Kühr. *With Illustrations.*

Palestine. *Palestine Exploration Fund, Q. Statement* (1896): 24–47. **Hill.**

A Journey East of the Jordan and the Dead Sea, 1895. By Gray Hill. *With Illustrations.*

Persia. **Vaughan.**

Journeys in Persia (1890–91). By Captain H. B. Vaughan. From the *Geographical Journal* for January and February, 1896. Size 10 × 6½, pp. 32. *Map.*

Sakhalin. *Verh. Ges. Erdk. Berlin* **23** (1896): 58–68. **Krassnow.**

Herr Professor v. Krassnow: Beobachtungen aus dem Gebiet der nordostasiatischen Inselwelt.

This article is specially summarized in the *Journal.*

AFRICA.

Abyssinia. *Oesterreichische Monatsch. Orient* **21** (1895): 129–132. **Paulitschke.**

Die heutige Lage der Italiener in Abessinien. Von Professor Dr. Philipp Paulitschke.

Africa. **Götzen.**

Durch Afrika von Ost nach West. Resultate und Begebenheiten einer Reise von der Deutschostafrikanischen Küste bis zur Kongomündung in den Jahren 1893–94. Von G. A. Graf von Götzen. Berlin: D. Reimer, 1895. Size 12½ × 8½, pp. xii. and 418. *Maps and Illustrations. Presented by the Publishers.*

The journey described in this splendidly got up book was reported in the *Journal*, vol. v. (1895), pp. 354–360.

Algeria—Ostrich-rearing. **Forest.**

B. and Mém. S. Africaine de France (1895): 152–180, 211–253, 271–291.

L'autruche de Barbarie. Par J. Forest aîné.

British West Africa—Ashanti. ———

Gold Coast. Further Correspondence relating to Affairs in Ashanti. [C.—7917.] London: Eyre and Spottiswoode, 1896. Size 13½ × 8½, pp. xii. and 240. *Price* 2*s.* Ditto (in continuation). [C.—7918.] London: Eyre and Spottiswoode, 1896. Size 13½ × 8½, pp. xiv. and 150. *Price* 1*s.* 4*d.*

Central Africa—Partition Treaties. **Schirmer.**

H. Schirmer. Les Traités de Partage de 1894 en Afrique Centrale (Extrait des *Annales de Géographie*) (Nos. 17, du 15 juillet 1895 et 20, du 15 Janvier 1896). Paris: A. Colin & Co. Size 10 × 6½, pp. [36]. *Maps. Presented by the Author.*

Congo. *B.S. d'Études coloniales* **2** (1895): 301–391. **Meuleman.**

Étude sur l'élevage des animaux domestiques au Congo. Par E. Meuleman. *With Illustration.*

Eastern Sudan. **Slatin.**

Fire and Sword in the Sudan. A Personal Narrative of Fighting and Serving the Dervishes, 1879–1895. By Rudolf C. Slatin Pasha, C.B. Translated by Major J. R. Wingate, C.B., etc., London: E. Arnold, 1896. Size 10 × 6½, pp. xx. and 636. *Portrait, Map, Plan, and Illustrations. Price* 21*s. Presented by the Publisher.*

This will be specially noticed.

French Congo—Sanga. *Mouvement G.* **13** (1896): 53–60. **Wauters.**

La Rivière Sanga. Par A. J. Wauters. *With Map.*

French West Africa. *B.S.G. Commerc. Paris* **18** (1896): 11–20. **Toutée.**

Par le Dahomey et le Niger moyen au Sahara français. Par M. le Capitaine Toutée. *With Map.*

German Colonies. ———

Weissbuch. Sechszehnter Theil. Berlin: Carl Heymanns Verlag, 1896. Size 12 × 8½, pp. 240.

This contains the annual reports on the development of Togo, the Cameroons, and German East and South-West Africa, and also includes the recent official correspondence relating to the South African Republic.

German East Africa. **Meinecke.**

Aus dem Lande der Suaheli. Teil I. Reisebriefe und Zuckeruntersuchungen am Pangani, von Gustav Meinecke. Vegetationsbilder von Dr. Otto Warburg.

Berlin: Deutscher Kolonial-Verlag (G. Meinecke), 1895. Size 10 × 6½, pp. 194. *Map and Illustrations.*

An interesting series of letters from the East Coast of Africa, describing the land, people, and products of the German sphere of influence, and illustrated by a selection of views and pictures of plants of quite unusual excellence.

German West Africa—Togo. *Petermanns M.* **42** (1896): 11–20, 29–33. **Conradt.**

Das Hinterland der deutschen Kolonie Togo. Van L. Conradt.

German West Africa—Cameroons. *Ymer* **14** (1894): 65–120. **Dusén.**

Om Kamerunområdet. Af. P. Dusén. *With Map and Illustrations.*

Italian Possessions in Africa. ——

Possessi e Protettorati in Africa. Estratto dall' *Annuario Statistico Italiano*, 1894. [Rome, 1896.] Size 10½ × 7½, pp. 50.

Madagascar. **Spielmann.**

Aus allen Welttheilen **27** (1895): 49–54, 119–124; (1896): 153–158, 177–182.

Madagascar. Von Dr. C. Spielmann.

Madagascar—Antananarivo Annual. **Sibree and Baron.**

The Antananarivo Annual and Madagascar Magazine. Edited by the Rev. J. Sibree and Rev. R. Baron. No. xix. Christmas, 1895 (Part iii. of vol. v.). Antananarivo. London: J. Haddon & Co., 1895. Size 8½ × 5½, pp. iv. and [128]. *Map. Presented by the Rev. J. Sibree.*

Madagascar—Flora. *Rev. Scientifique* (4) **5** (1896): 225–234. **Bureau.**

La flore de Madagascar. Par M. Ed. Bureau.

Portuguese East Africa. *B.S.G. Lisboa* **14** (1895): 535–563. **Castilho.**

Acerca de Lourenço Marques. Perigos e deveres . . . pelo socio conselheiro Augusto de Castilho.

Portuguese East Africa. *B.S.G. Lisboa* **14** (1895): 565–738. **Himeria.**

Padroado de Portugal em Africa. Relatorio da prelazia de Moçambique pelo Reverendo Bispo de Himeria.

Portuguese East Africa. *B. S. G. Lisboa* **14** (1895): 491–533. **Machado.**

O territorio de Manica e Sofala sob a administraçao da Companhia de Moçambique, pelo socio Joaquim Machado.

St. Thomas. *B.S.G. Lisboa* **14** (1895): 777–819. **Castilho.**

A provincia de S. Thomé e o golfo de Benim. Por Augusto de Castilho.

Sahara—Dunes. *Rev. Scientifique* (4 S.) **5** (1896): 275–276 **Privat-Deschanel.**

La fixation des dunes au Sahara. Par M. Paul Privat-Deschanel.

South Africa. **Harris.**

The Fate of South Africa. By F. Rutherford Harris. From the *New Review*, March, 1896. Size 10 × 7, pp. [18]. *Map.*

West Africa. *A travers le Monde* (*Tour du Monde*): (1896): 41–44. ——

De Dakar au Cap. Juby: Voyage sur la Côte du Sahara. *With Illustrations.*

West Africa—Bida. *Church Miss. Intelligencer*, N.S. 21 (1896): 186–192. **Tugwell.**

Visit to Bida. Bishop Tugwell's Diary.

West Africa—Sudan. **Robinson.**

Hausaland; or, Fifteen Hundred Miles through the Central Soudan. By Charles Henry Robinson. London: Low and Co., 1896. Size 9½ × 6, pp. xvi. and 304. *Map, Portrait, and Illustrations. Price* 14*s.*

This work will be specially noticed.

Zanzibar—Slavery. **Waller.**

The Case of our Zanzibar Slaves: why not liberate them? By the Rev. Horace Waller. London: P. S. King & Son, 1896. Size 8½ × 5½, pp. 20. *Presented by the Author.*

The last words of the Rev. Horace Waller, whose death immediately followed the publication of this pamphlet, devoted, like most of his other writings, to the denunciation of African slavery under European governments.

NORTH AMERICA.

Canada—Quebec.

Reports of the Commissioner of Crown Lands of the Province of Quebec. 1868–1895. [27 Reports.] Quebec, 1869–1895. Size 10 × 6½. *Maps.*

Mexico. *J.S. Arts* **44** (1896): 251–262. **Cheesewright.**

The Mexican Drainage Canal. By Fredk. Henry Cheesewright. *With Map and Illustrations.*

A note on this subject will appear in the Monthly Record.

Mexico—Tehuantepec Ship Railway. *National G. Mag.* **7** (1896): 64–72. **Corthell.**

The Tehuantepec Ship Railway. By Elmer L. Corthell. *With Maps.*

Mexico—Yucatan. **Millspaugh.**

Field Columbian Museum. Publication 4. Botanical Series, vol. i. No. 1. Contribution to the Flora of Yucatan. By Charles Frederick Millspaugh. Chicago, 1895. Size 10 × 6½, pp. 56. *Plates. Presented by the Director of the Museum.*

United States—Baltimore. **Thomas.**

John Hopkin's University Studies in Historical and Political Science. Fourteenth Series. II. The City Government of Baltimore. By Thaddeus P. Thomas, PH.D. Baltimore: The Johns Hopkins Press, 1896. Size 10 × 6½, pp. 52.

United States—California. *Appalachia* **8** (1896): 41–57. **Solomons.**

Mount Goddard and its Vicinity, in the High Sierra of California. By Theodore S. Solomons. *With Map and Illustrations.*

Mr. Solomons takes the Californian Government to task for their neglect of the survey of the mountainous districts of the State; and gives an interesting account, with a sketch-map, of his own explorations.

United States Geological Atlas. *B. American G.S.* **27** (1895): 337–351. **Willis.**

The Development of the Geologic Atlas of the United States. By Bailey Willis.

United States—Indian Territory. *B. American G.S.* **27** (1895): 272–276. **Gannett.**

Indian Territory. By Henry Gannett.

United States—Montana. *Appalachia* **8** (1896): 57–69. **Sperry.**

Avalanche Basin, Montana Rockies. By Lyman B. Sperry. *With Illustrations.*

United States—Pike's Expeditions. **Cones.**

The Expeditions of Zebulon Montgomery Pike to Headwaters of the Mississippi River, through Louisiana Territory, and in New Spain during the years 1805–6–7. A New Edition, now first reprinted in full from the Original of 1810, with copious Critical Commentary, Memoir of Pike, New Map and other Illustrations, and complete Index. By Elliott Cones. Three vols. Vol. i., Memoir of the Author—Mississippi Voyage; Vol. ii., Arkansaw Journey—Mexican Tour; Vol. iii., Index—Maps. London: Simpkin and Co., 1895. Size 10 × 6½, pp. cxiv. and 956. *Portrait. Price* £2.

This work has been re-edited, which, on account of the confused manner in which it originally appeared, means, in a certain sense, re-written, and it is provided with a series of original footnotes revealing much of the personality of the Editor.

United States—Washington. *B. American G.S.* **27** (1895): 239–255. **Bogue.**

Stampede Pass, Cascade Range, Washington. By Virgil G. Bogue. *With Map and Illustrations.*

CENTRAL AND SOUTH AMERICA.

Argentine Republic. **Quevedo.**

Anales del Museo de La Plata. Seccion de Arqueologia. I. Notas Arqueológicas apropósito de un objeto de arte indigena. Por Samuel A. Lafone Quevedo. La Plata, 1890. Size 18½ × 13, pp. 14.

Argentine Republic—Buenos Ayres. *Rev. Museo La Plata* **7** (1895): 157–168. **Lahille.**

Nota sobre la industria de la pesca en la Provincia de Buenos Aires (excursion de Setiembre-Octubre 1895). Por el Dr. Fernando Lahille.

Argentine Republic—Mendoza. *Rev. Museo La Plata* **7** (1895): 13–96.

Exámen Topográfico y Geológico de los Departamentos de San Cárlos, San Rafael y Villa Beltran, Provincia de Mendoza (distritos carboniferos, etc.). *With Maps and Plates.*

Argentine Republic—Rioja. *Rev. Museo La Plata* **7** (1895): 169–180. **Hauthal.**
Primera ascension al Nevado Colorado de Famatina (6150 m.) (Provincia de la Rioja). Por Rodolfo Hauthal.

Argentine Republic—San Luis. *Rev. Museo La Plata* **7** (1896): 97–128. **Valentin.**
Informe sobre una excursion efectuada en la Provincia de San Luis (Republica Argentina), en los meses de Setiembre y Octubre de 1894. Por el Dr. Juan Valentin. *With Sections.*

Brazil. *B. Union G. Nord de la France* **15** (1894): 241–249, 313–330. **Desvernine.**
Voyage de M. Pierre F. Desvernine au Brésil, à travers les provinces de Rio-de-Janeiro, Minas-Geraes et Rio Grand do sul.

Brazil—Matto Grosso. *Rev. Museo La Plata* **6** (1895): 221–250. **Koslowsky.**
Tres semanas entre los indios Guatós. Excursion efectuada en 1894. Por Julio Koslowsky. *With Plates.*

Brazil—Matto Grosso. *Rev. Museo La Plata* **6** (1895): 373–411. **Koslowsky.**
Algunos datos sobre los Indios Bororós. Por Julio Koslowsky. *With Plates.*

British Guiana. *Nineteenth Century* (1896): 390–398. **Comyn.**
The Seamy Side of British Guiana. By Francis Comyn.

British Guiana and Venezuela Boundary. ——
Venezuela. No. 1 (1896). Documents and Correspondence relating to the Question of Boundary between British Guiana and Venezuela. London: Eyre & Spottiswoode, 1896. Size 13½ × 8½, pp. 444. *Maps. Price* 4*s.* 4*d.*
Maps to accompany the above. *Price* 2*s.* 9*d.*
This blue-book contains a preliminary statement, dealing with the nature and extent of the British claim, and three appendices: (1) Extracts, mainly from Spanish archives, 1595–1802; (2) correspondence relating to early administration of British Guiana, and to the question of boundary with Venezuela, 1799–1893; (3) a series of nine maps. The maps, which are published separately, include (1) Extract from official chart of the Dutch West India Company, 1635; (2) Blaeuw's map of Guiana, 1640; (3) extract from official map of [English] Committee of Trade and Plantations, 1733; (4) extract from Dr. Anville's [*sic*] map of Amérique Méridionale, 1748; (5) sketch-map by Dutch Director-General, 1749; (6) Thompson's Chart of the coast of Guiana, etc., 1783; (7) inset of Bouchenroeder's map of the colony of Essequibo and Demerara, 1798; (8) De Pons "Carte de la Capitainerie Générale de Caracas," 1804; (9) Map prepared to illustrate various lines referred to in the correspondence.

British Guiana Boundary. *Petermanns M.* **42** (1896): 21–23. **Wichmann.**
Der Streit über die Grenze von Britisch-Guayana. Von H. Wichmann. *With Map.*

British Guiana Minerals. **Anderson and Dunn.**
British Guiana. Report by Mr. C. W. Anderson, Government Surveyor, and Diary and Report by Mr. W. A. Dunn, on the Conglomerate Prospection Expedition. Georgetown, Demerara, 1895. Size 13½ × 8½, pp. 34. *Presented by the Colonial Office.*

Chile. **Anrique.**
Bibliografía Maritima Chilena (1840–1894). Por Nicolas Anrique R. Santiago de Chile: Imp. Cervantes, 1895. Size 8 × 6, pp. 206.

Colombia—Panama Canal. *National G. Mag.* **7** (1896): 59–64. **Hill**
The Panama Canal Route. By Robert T. Hill. *With Illustrations.*

Nicaragua Canal. *National G. Mag.* **7** (1896): 73–76. **Greely.**
The Present State of the Nicaragua Canal. By General A. W. Greely.

Nicaragua—Mosquito Coast. *Z. Ges. Erdk. Berlin* **30** (1895): 498–501. **Richter.**
Der Streit um die Mosquito-Küste. Von Julius Richter.

Peru. *B. American G.S.* **27** (1895): 256–271. **Sears.**
The Coast Desert of Peru. By Alfred F. Sears.

Tierra del Fuego. *Ymer* **14** (1894): 208–210. **Nordenskjöld.**
Eldslandet. Några anteckningar af Otto Nordenskjöld.

Venezuela. *National G. Mag.* **7** (1896): 49–58. **Curtis.**
Venezuela: her Government, People, and Boundary. By William E. Curtis. *With Map and Illustrations.*

Venezuela. **Sievers.**

Mittheilungen der Geographischen Gesellschaft in Hamburg. Band xii. Zweite Reise in Venezuela in den Jahren 1892–93 auf Kosten der Geographischen Gesellschaft in Hamburg ausgeführt von Dr. Wilhelm Sievers. Hamburg: L. Friederichsen & Co., 1896. Size 9½ × 6½, pp. 328. *Presented by the Geographical Society of Hamburg.*

This will be specially referred to.

Venezuela Boundary. *Globus* **69** (1896): 53–55. **Sievers.**

Die Grenzen Venezuelas. Von Prof. W. Sievers, Giessen. *With Map.*

AUSTRALASIA AND OCEANIC ISLANDS.

Australia. **Collingridge.**

The Discovery of Australia. A Critical, Documentary and Historic Investigation concerning the Priority of Discovery in Australasia by Europeans before the arrival of Lieut. James Cook, in the "Endeavour," in the year 1770. With Illustrations, Charts, Maps, Diagrams, etc., Copious Notes, References, Geographical Index, and Index to Names. By George Collingridge. Sydney: Hayes Bros., 1895. Size 13 × 10½, pp. xvi. and 376. *Price* 25*s.*

This work will be specially noticed.

Australia. *Nineteenth Century* (1896): 457–464. **White.**

Australia as a Strategic Base. By A. Silva White.

Australian Exploration. *J. R. Colonial I.* **27** (1896): 154–176. **Horn.**

The Scientific Exploration of Central Australia. By William Austin Horn.

Hawaii. **Chambers.**

Johns Hopkins University Studies in Historical and Political Science. Fourteenth Series. I. Constitutional History of Hawaii. By Henry E. Chambers. Baltimore, 1896. Size 10 × 6, pp. 40.

New South Wales—Land Department. ———

New South Wales. Fifteenth Annual Report of the Department of Lands, being for the year 1894. Sydney, 1895. Size 13½ × 8½, pp. iv. and 94. *Maps and Diagrams.*

New South Wales. **Bladen.**

Historical Records of New South Wales. Vol. iii., Hunter, 1796–1799. Edited by F. M. Bladen. Sydney: C. Potter, 1895. Size 9 × 6, pp. xxxviii. and 856. *Maps.*

New South Wales. **Coghlan.**

The Wealth and Progress of New South Wales, 1894. By T. A. Coghlan. Vol. i. Eighth Issue. Sydney, 1895. Size 9 × 6, pp. 466. *Presented by the Agent-General for New South Wales.*

New Zealand. **Rusden.**

History of New Zealand. By G. W. Rusden. Second Edition. 3 vols. Melbourne, Melville, Mullen, and Slade, 1895. Size 8½ × 5½, pp. (vol. i.) xvi., xliv., and 496; (Vol. ii.) xiv. and 642; (Vol. iii.) xii. and 510. *Maps. Presented by the Author.*

The preface to this work contains a report of the libel action in which the publication of the first edition involved the author, and expressions of confidence in the history as a whole contributed by many friends. It is brought down to 1894; and at the end a paper on General Gordon and the Egyptian Sudan finds a place.

New Zealand—Avifauna. *Globus* **69** (1896): 21–24, 42–45, 55–57. **Finsch.**

Charakteristik der Avifauna Neu-Seelands als zoogeographische Provinz in ihren Veränderungen und deren Ursachen. Von Dr. O. Finsch (Delmenhorst). *With Illustrations.*

Queensland. **Jack.**

Stratigraphical Notes on the Georgina Basin, with reference to the question of Artesian Water. By Robert L. Jack. [Read before the Royal Society of Queensland, July 7, 1895.] Size 8½ × 5½, pp. 6. *Presented by the Author.*

Victoria—Statistics. ———

Statistical Register of the Colony of Victoria, etc., 1893. Melbourne [not dated]. Size 13 × 8½.

POLAR REGIONS.

Antarctic. *M.G. Ges. Hamburg* **11** (1896): 62–79. **Petersen.**

"Die Erforschung des Dirk Gerritsz-Archipel." Einige Bemerkungen zu dem Aufsatze. "Das Wiedererwachen der antarktischen Forschung," in Dr. A. Petermann's 'Mittheilungen,' 1895. Heft 6. Von Dr. Johannes Petersen.

Antarctic Exploration. *Aus allen Welttheilen* **27** (1896): 170–178. **Mewius.**

Zur Südpolforschung. Von F. Mewius.

Arctic. *National G. Mag.* **7** (1896): 27–31. **Jackson.**

The Arctic Cruise of the United States Revenue Cutter "Bear." By Dr. Sheldon Jackson, United States General Agent of Education in Alaska. *With Illustrations.*

Arctic—Björling and Kallstenius. *Ymer* **14** (1894): 1–16. **Nordenskiöld.**

Om Björlings och Kallstenii expedition till trakten af Smith Sound. Af G. Nordenskiöld.

Arctic Exploration. *National G. Mag.* **7** (1896): 32–39. **Greely.**

The Scope and Value of Arctic Explorations. By General A. W. Greely.

This paper was read at the Sixth International Geographical Congress.

Arctic Ice-limits. **Ryder.**

Isforholdene i Nordhavet, 1877–1892. Af Carl Ryder. Copenhagen, 1896. Size 8 × 5½, pp. 28. *Maps. Presented by the Author.*

On the position of the ice in the sea between Spitzbergen, Iceland, and Greenland for every year from 1877 to 1892. Sixteen sketch-maps are given, showing the south-western limit of the ice for various months in each of the years named.

Arctic Ocean. *Ymer* **14** (1894): 145–164. **Ohlin.**

Nagra anteckningar om den nutida hvalfångsten i Norra Ishafvet. Af Axel Ohlin.

North-East Passage. *Scottish G. Mag.* **12** (1896): 68–75. ———

The Story of the North-East Passage.

Historical account of explorations along the north coast of Asia.

Spitzbergen. *Ymer* **24** (1894): 25–61. **Hamberg.**

En resa till norra Ishafvet sommaren 1892 företagen med understöd af Vegastipendiet. Af Axel Hamberg. *With Map and Illustrations.*

MATHEMATICAL GEOGRAPHY.

Astronomical Tables. **Johnson.**

The Bearings of the Principal Bright Stars of greater declination than 23° north or 23° south, also those of the Moon and Planets when similarly situated. By A. C. Johnson, R.N. London: J. D. Potter, 1895. Size 9½ × 6½, pp. 44. *Price* 3*s. Presented by the Publisher.*

Catalogue of Admiralty Charts, etc. ———

Catalogue of Admiralty Charts, Plans, and Sailing Directions. Corrected to December 31, 1895. Published by order of the Lords Commissioners of the Admiralty. London: J. D. Potter [1896]. Size 11 × 7½, pp. 254. *Presented by the Hydrographic Department, Admiralty.*

Maps of Europe. **Venukoff.**

Sur la réduction des cartes topographiques à la même échelle. Par M. Venukoff. Size 10 × 6½, pp. 4. *Presented by the Author.*

M. Venukoff remarks on the importance of producing from the staff maps of the countries of Europe, a map of the whole Continent on the scale of 1 : 100,000, or even of 1 : 50,000.

Surveying—Levelling **Reinhertz.**

Nova Acta K. Leop.-Carol. Deutschen A. Naturforscher **62** (1894): 89–194.

Mittheilung einiger Beobachtungen über die Schätzungsgenauigkeit an Maassstäben, insbesondere an Nivellirskalen. Von Dr. C. Reinhertz. *With Plates.*

A critical memoir on the degree of accuracy in levelling operations, with a discussion of instrumental and personal errors.

Time Reckoning. **Floquet and Sarranton.**

B. Trim. G. et de d'Archéologie d'Oran **16** (1896): 76–85.

L'heure décimale. Note de M. G. Floquet. Réplique de M. de Sarranton.

PHYSICAL AND BIOLOGICAL GEOGRAPHY.

Air in the Soil. *C.R.* **122** (1896): 109–112. **Dehérain and Demoussy.**

Sur la circulation de l'air dans le sol. Par MM. P. P. Dehérain et Demoussy.

Aurora. *Oversight K. Danske Vidensk. Selsk.* (1895): 279–302. **Paulsen.**

Effet de l'humidité de l'air et action du champ magnétique terrestre sur l'aspect de l'aurore boréale. Par Adam Paulsen.

Ballooning. *Bihang K. Svenska Vetens. A.* **20** (1895). **Andrée.**

Iakttagelser under en ballongfärd . . . af S. A. Andrée.

In this fascicule Mr. Andrée has five short papers describing a series of balloon journeys undertaken on August 9, October 19, 1893, February 26, April 7, and July 14, 1894. Each trip is illustrated by a series of synoptical weather-charts, track-charts, barometer and thermometer curves, illustrating the conditions in which the ascents were made.

Ballooning and Geography. *Verh. Ges. Erdk. Berlin* **23** (1896): 49–58. **Berson.**

A. Berson: Geographisches aus dem Luftballon.

This paper is specially noticed.

Botanical. **Lister.**

Guide to the British Mycetozoa exhibited in the Department of Botany, British Museum (Natural History). By Arthur Lister, 1895. Size 8½ × 5½, pp. 42. *Illustrations. Presented by the Trustees of the British Museum.*

Distribution of Carnivora. **Grevé.**

Nova Acta K. Leop.-Carol. Deutschen A. Naturforscher **63** (1895): 1–280.

Die geographische Verbreitung der jetzt lebenden Raubthiere. Von Carl Grevé. *With Maps.*

The twenty-one maps here presented form a complete atlas of the distribution of the principal genera of the Carnivora.

Geology—Rocks. ———

British Museum (Natural History), Cromwell Road, London, S.W. Mineral Department. An Introduction to the Study of Rocks, 1895. Size 8½ × 5½, pp. 118. *Plan. Presented by the Trustees of the British Museum.*

Meteorology—Mont Blanc. *Rev. Scientifique* (4 S.) **5** (1896): 257–259. **Janssen.**

Troisième ascension à l'Observatoire du sommet du Mont-Blanc. Par M. J. Janssen.

Oceanography—Baltic. *G.Z.* **2** (1896): 142–158. **Schott.**

Die Hydrographie des Skageracks, Kattegats und der Ostsee. Von Dr. Gerhard Schott in Hamburg. *With Diagrams.*

Oceanography—Gulf Stream. *Petermanns M.* **42** (1896): 25–29. **Lindenkohl.**

Resultate der Temperatur- und Dichtigkeitsbeobachtungen in den Gewässern des Golfstroms und des Golfs von Mexico durch das Bureau des U.S. Coast and Geodetic Survey. Von A. Lindenkohl. *With Maps.*

An English version appears in *Science*, N.S. 3 (1896): 271–274.

Oceanography—Mediterranean. ———

Berichte der Commission für Erforschung des östlichen Mittelmeeres. Vierte Reihe. (Aus den Denkschriften der Kais. Akademie der Wissenschaften in Wien. Bd. lxii.) Vienna: Carl Gerold's Sohn [not dated]. Size 12 × 9½, pp. 176. *Maps and Plates. Presented by the Academy.*

The oceanographical part of this report deals with the voyage of the Austrian man-of-war *Taurus* in the Sea of Marmora in 1894, and has already been summarized in the *Journal*, vol. vi. (1895), p. 81.

Oceanography—Shoals. *American J. Sci.* (4) **1** (1896): 106–110. **Littlehales.**

Improbability of finding Isolated Shoals in the Open Sea by sailing over the Geographical Positions in which they are charted. By G. W. Littlehales.

This will be referred to in the *Journal*.

Physical Geography. **Klein.**

Jahrbuch der Astronomie und Geophysik. Enthaltend die wichtigsten Fortschritte auf den Gebieten der Astrophysik, Meteorologie und physikalischen Erdkunde. Unter Mitwirkung von Fachmännern: herausgegeben von Dr. Hermann J. Klein. VI. Jahrgang 1895. Leipzig: E. H. Mayer, 1896. Size 9 × 6, pp. x. and 376. *Maps and Illustrations. Price 7s.*

Springs—Temperature. *C.R.* **122** (1896): 97–99. **Martel.**
Sur quelques anomalies de la température des sources. Note de M. E.-A. Martel.

Termites and Soil. *Rev. Museo La Plata* **6** (1895): 413–415. **Koslowsky.**
El rol de los Termitos en la distribucion de los centros de vegetacion arbórea en los llanos. Por Julio Koslowsky. *With Plate.*

Terrestrial Magnetism. *Terrestrial Magnetism* **1** (1896): 28–31. **Bauer.**
Halley's Earliest Equal Variation Chart. Reproduced in *facsimile*, for the first time, from a photograph furnished by Thos. Ward, Esq., of the chart in his possession. *Frontispiece.* Text by L. A. Bauer.

Terrestrial Magnetism. *Atti R.A. Lincei* (S. 5), *Rendiconti* **5** (1896): 41–45. **Sella.**
Misure relative della componente orizzontale del magnetismo terrestre sul Monte Rosa, a Biella ed a Roma. Nota di Alfonso Sella.

Terrestrial Magnetism. *Terrestrial Magnetism* **1** (1896): 18–27. **Schmidt.**
Die Vertheilung des erdmagnetischen Potentials in Bezug auf beliebige Durchmesser der Erde. Von Dr. Ad. Schmidt (Gotha).

Terrestrial Magnetism. **Weyer.**
Nova Acta K. Leop.-Carol. Deutschen A. Naturforscher **63** (1895): 311–398.
Die magnetische Declination und ihre säculare Veränderung für 48 Beobachtungsörter, berechnet als periodische Function für jeden einzelnen Ort aus den daselbst angestellten Beobachtungen. Von Dr. G. D. E. Weyer.

BIOGRAPHY.

Alexander the Great. **Budge.**
The Life and Exploits of Alexander the Great, being a series of Ethiopic Texts edited from Manuscripts in the British Museum and the Bibliothèque Nationale, Paris, with an English Translation and Notes. By E. A. Wallis Budge. 2 vols. Vol. i., the Ethiopic Text, Introduction, etc. Vol. ii., the English Translation. London: C. J. Clay and Sons, 1896. Size 12 × 8, pp. (vol. i.) xvi., liv., and 384; (vol. ii.) 610. *Frontispiece. Presented by Lady Meux.*

This superb work, printed for private circulation at the sole expense of Lady Meux, presents a complete account of the Ethiopic legends regarding the life, travels, and conquests of Alexander the Great, giving the original text as well as the translation and notes.

Astrup. *Globus* **69** (1896): 122. **Nielsen.**
Eivind Astrup. Von Prof. Dr. Yngvar Nielsen in Christiania. *With Portrait.*

Biographical Dictionary. **Lee.**
Dictionary of National Biography. Edited by Sidney Lee. Vol. xlv. Pereira—Pockrich. London: Smith, Elder & Co., 1896. Size 10 × 6¼, pp. vi. and 458. *Price* 15*s.*

The following names of geographical interest appear among the notices in the present volume: Sir Arthur Purves Phayre, by Major Broadfoot; Governor Arthur Phillip, by C. A. Harris; Constantine John Phipps, by Professor J. K. Laughton; Admiral Bedford Capperton Trevelyan Pim, by C. H. Coote; and Walter Chichele Plowden, by B. B. Woodward.

NEW MAPS.

By J. Coles, *Map Curator*, R.G.S.

EUROPE.

England and Wales. **Ordnance Survey.**
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London—Re-survey, VII. 4, 5, 6, 14, 15, 24, 25, 26, 36, 47, 48, 54, 55, 56, 58, 65, 66, 68, 73, 74, 77, 87, 88: XI. 13, 27; XII. 15; XV. 87. 2*s.* 6*d.* each. Index, 3*d.*
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Germany. **Langhans.**

Justus Perthes' Staatsbürger-Atlas. 24 Kartenblätter mit über 60 Darstellungen zur Verfassung und Verwaltung des Deutschen Reichs und der Bundesstaaten. Mit Begleitworten. Von Paul Langhans. Gotha: Justus Perthes. 1896.

The statistical information contained in this atlas refers entirely to the German Empire. The work of compiling must have been very laborious, and there is hardly any subject connected with the population, trade, commerce, military organization, etc., of Germany on which this little atlas may not be consulted with advantage.

AFRICA.

Abyssinia. **Italian Ministry of War.**

Seconda Edizione della Nuova Carta dei Dominii e Protettorati Italiani nell' Eritrea e Regioni Limitrofe (Sudan-Abissinia-Harar). Scale 1: 1,500,000 or 23·6 stat. miles to an inch. Eseguita dal Laboratorio Foto-litografico del Ministero della Guerra. Gennaio, 1896.

The whole of Abyssinia and parts of the neighbouring countries are shown on this map. All routes are laid down, and a table of distances between the principal places is given.

East Central Africa. **Götzen.**

Reiseweg des Lieutenants Graf von Götzen von Pangani in Deutsch-Ostafrika zum Kongo 1893–1894. 2 sheets. Nach dem Aufnahmen des Reisenden construirt und gezeichnet von Dr. Richard Kiepert und Max Moisel. Scale 1: 250,000 or 3·9 stat. miles to an inch. Geographische Verlagshandlung Dietrich Reimer (Hoeffer and Vohsen) in Berlin.

The important journey across Africa from Pangani to Kivu lake and the Congo, accomplished by Count von Götzen in 1893–1894, is shown, on a comparatively large scale, on this map. The route has been most carefully plotted from the traveller's journals, the date, elevation above sea-level, etc., being given for each day. This map is of special interest, as the portion of Count Götzen's route between long. 30° E. and the Congo traverses entirely new country. An inset is given, showing the whole of Count Götzen's route across Africa.

German East Africa. **Kiepert and Moisel.**

Karte von Deutsch-Ostafrika. Scale 1: 300,000 or 4·7 stat. miles to an inch. Geographische Verlagshandlung Dietrich Reimer, Berlin. Sheets: A 1, Kivu See; B 2, Urúndi.

These are two sheets of the large map of German East Africa in course of publication. Sheet A 1 contains the country round Kivu lake, and the country traversed by Count von Götzen to the west. Sheet B 2, contains the country in the vicinity of Emin Pasha gulf, Victoria Nyanza. The scale is sufficiently large to admit of

considerable detail being shown, and numerous useful notes are given on the body of the map. Where positions have been fixed by astronomical observations, the latitudes and longitudes are written under the name of the place.

Timbuktu. **Vuillot.**

Carte topographique de la Région de Tombouctou dressée par P. Vuillot, Membre de la Société de Géographie de Paris. Scale 1 : 100,000 or 1·6 stat. mile to an inch. Publié sous le patronage de la Société de Géographie de Paris. *Presented by the Author.*

This map has been compiled from the observations of the following French officers: M. M. Hourst, Baudry, and du Belloy, naval officers detached from the Niger flotilla; the itineraries of MM. Puypéroux, Gautheron, Fourpeot, Bluzet, Florentin, Imbert, and Laperrine, officers detached from head-quarters at Timbuktu, and Gundam. The map embraces the country in the vicinity of Timbuktu, and the system of lakes to the west of that place. The positions fixed by astronomical observation have the latitudes and longitudes written under the name of the place. Some notes are given, and a clear explanation of the symbols employed in the construction of the map.

Transvaal. **Jeppe.**

Map of the Southern Goldfields of the Transvaal. Compiled from Official Sources by Fred. Jeppe, Surveyor-General's Department, Pretoria, 1896. Scale 1 : 291,000 or 4·6 stat. miles to an inch. Argus Co., Ltd., Johannesburg. 2 sheets. *Presented by the Author.*

Persons interested in the Southern Goldfields of the Transvaal will find this a useful map. In addition to the information it contains with regard to mining property, all means of communication by rail and road are laid down.

West Africa. **Gruner, Döring, and Carnap.**

Expedition des Deutschen Togo Komitee's unter Dr. Gruner, Dr. Döring u. Pr. Lt. v. Carnap. 1894–1895.

The route followed by the German expedition under Drs. Gruner, Döring, and Lieut. v. Carnap, 1894–1895, into the interior from Togoland to the Niger, is laid down on this map.

West Central Africa. **Passarge.**

Reiseroute der Expedition des Deutschen Kameruncomités in den Jahren 1893–94. Aufgenommen von Dr. S. Passarge. Construirt und gezeichnet von Dr. M. Limpricht. Scale 1 : 350,000 or 5·5 stat. miles to an inch. Berlin: D. Reimer (Hoefer and Vohsen).

The explorations of Dr. Passarge in the Upper Binue region are very clearly shown on this map, as well as the routes of other explorers. Explanatory notes as to meaning of native geographical terms, etc., are given. The map is very nicely drawn and printed in five colours.

AMERICA.

British North America. **Rand, McNally & Co.**

(1) Indexed Pocket Map and Shippers' Guide of British Columbia. Scale 1 : 2,400,000 or 37·8 stat. miles to an inch. (2) Indexed District Map and Shippers' Guide of Quebec. Scale 1 : 1,160,000 or 16·7 stat. miles to an inch. Rand, McNally & Co., Chicago and New York. *Presented by the Publishers through E. Stanford, Esq.*

United States. **Rand, McNally & Co.**

Indexed County and Township Pocket Maps and Shippers' Guides of Arizona (Scale 1 : 1,760,000 or 27·7 stat. miles to an inch): Kentucky (1 : 1,160,000 or 18·3 stat. miles to an inch), Massachusetts (1 : 460,000 or 7·3 stat. miles to an inch), Michigan (1 : 1,025,000 or 16·2 stat. miles to an inch), Pennsylvania (1 : 766,000 or 12·1 stat. miles to an inch), Washington (1 : 1,030,000 or 16·2 stat. miles to an inch). Rand, McNally & Co., Chicago and New York. *Presented by the Publishers through E. Stanford, Esq.*

AUSTRALIA.

Western Australia. **London and Western Australian Exploration Co.**

A Map of the West Australian Gold Fields, compiled and published for the London and Western Australian Exploration Company. Scale 1 : 760,320 or 12 stat. miles to an inch. Sheets 8, 9, 11, 12. London: E. Stanford. *Presented by E. Stanford, Esq.*

These are the first four sheets of a map of Western Australia, which when completed will consist of twelve sheets. Though primarily intended to illustrate the mineral returns of the country, it promises to be the best general map of this part of West Australia that has been produced in this country.

GENERAL.

World. **Bartholomew.**

Travellers' Route Chart of the World on Mercator's Projection. By J. G. Bartholomew, F.R.G.S. Equatorial scale, 15° to an inch. J. Bartholomew & Co., Edinburgh. Price, 1s. 6d. on cloth. *Presented by the Publishers.*

All the ocean steamship routes and the distance in miles are given on this map, as well as the difference in time for every fifteen degrees from Greenwich. At the foot of the map there are several insets of the principal ports of the world, the British Isles, and the Mediterranean. The map is clearly drawn, and will be useful for reference in matters connected with steam navigation.

CHARTS.

Atlantic Ocean. **Koninklijk Nederlandsch Meteorologisch Instituut.**

De Guinea en Equatorial Stroomen. Voor iedere maand afzonderlijk bewerkt volgens de gegevens van 2900 Journalen, gehouden aan boord van Nederlandsche Schepen. Utrecht, 1895. "Koninklijk Nederlandsch Meteorologisch Instituut. Stoom-Boek- en Steendrukkerij de Industrie," J. van Druten. *Price f.* 8·5. *Presented by the Royal Netherlands Meteorological Institute.*

The compilation of this atlas has been going on for a considerable time, and it contains the results of observations furnished by the journals of Dutch seafaring men with reference to the Equatorial and Guinea currents. These are given in a series of charts for each month of the year, showing the direction and speed of the current, the temperature of the surface water, the connection between the temperature of the air and the winds, the calms, and the rains. The charts are accompanied by explanatory letterpress. Great care has evidently been taken in the compilation of this atlas, and it forms a valuable addition to our knowledge of the physical conditions of this part of the Atlantic Ocean. The work has been specially noticed at p. 267 of the present volume.

Chile. **Chilian Hydrographic Office.**

Charts Nos. 52, Caleta Camarones, Caleta Chica o Buena, Caleta Gualaguala, Caleta Michilla: No. 53, Isla Juan Fernandez (Mas a Tierra); No. 54, Croquis de la Isla de Mas Afuera; No. 55, Exploracion del Archipielago de la Reina Adelaida. Oficina Hidrográfica de Chile, 1895. *Presented by the Chilian Hydrographic Office.*

Gulf of Mexico, etc. **Lindenkohl.**

(1) Spezifisches Gewicht $\left[^s\left(\frac{15\cdot6^\circ}{4^\circ}\right)\right]$ des Oberflächenwassers im Golf von Mexico und im Golfstrom. Nach den Beobachtungen von U.S.C.S. Blake, 1880–1882; U.S.C.S. Schr. Palinurus, 1878; U.S. Fish. Com. Str. Albatros, 1883–1886; u. H.M.S. Challenger, 1873. Gez. v. A. Lindenkohl.

(2) Temperaturen in Gulf von Mexico und im Golfstrom in der Tiefe von 460 m. (250 Faden). Nach den Temperaturbeobachtungen von Lieut. Com. C. D. Sigsbee, J. R. Bartlett u. W. H. Brownson, 1874–1883. Gez. v. A. Lindenkohl. Petermann's 'Geographische Mitteilungen,' Jahrgang, 1896, Taf. 3. Gotha: Justus Perthes, 1896. *Presented by the Publisher.*

United States Charts. **U.S. Hydrographic Office.**

Pilot Charts of the North Atlantic and North Pacific Oceans for February and March, 1896. Published monthly at the Hydrographic Office, Washington, D.C. Charles D. Sigsbee, Commander U.S. Navy, Hydrographer. *Presented by the U.S. Hydrographic Office.*

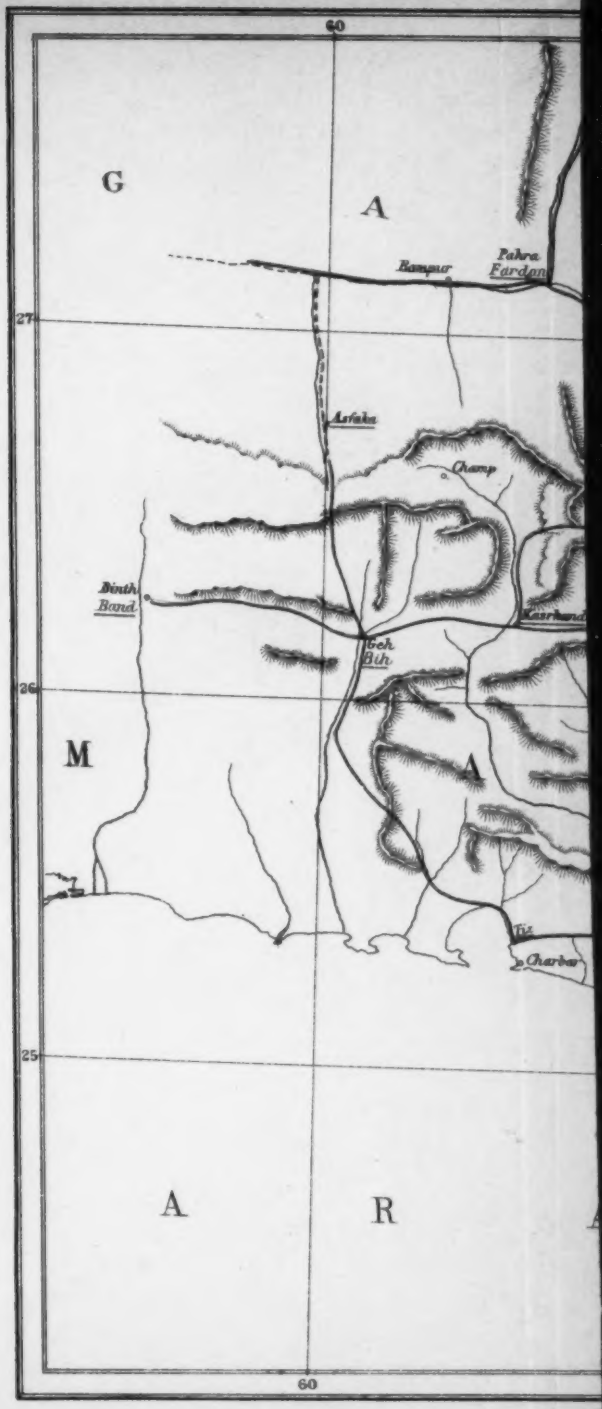
PHOTOGRAPHS.

Somaliland. **Gillett.**

Thirty-three Photographs of Somaliland, taken by F. Gillett, Esq., in 1894–1895. *Presented by F. Gillett, Esq.*

Mr. F. Gillett, who accompanied Dr. Donaldson Smith in the first part of his journey in Somaliland, has presented the Society with this interesting set of photographs. They represent scenes in the everyday life of the Somalis, incidents of travel, and the scenery of Somaliland. Many of the photographs are remarkably clear, and, from the subjects having been well selected, they form a valuable addition to the Society's collection.

N.B.—It would greatly add to the value of the collection of Photographs which has been established in the Map Room, if all the Fellows of the Society who have taken photographs during their travels, would forward copies of them to the Map Curator, by whom they will be acknowledged. Should the donor have purchased the photographs, it will be useful for reference if the name of the photographer and his address are given.


60
G
A
Rampur
Pahra
Fardan
27
Asfaka
Champ
Binth
Band
Kasrhand
Tech
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A
Tiz
Charbar
25
A
R
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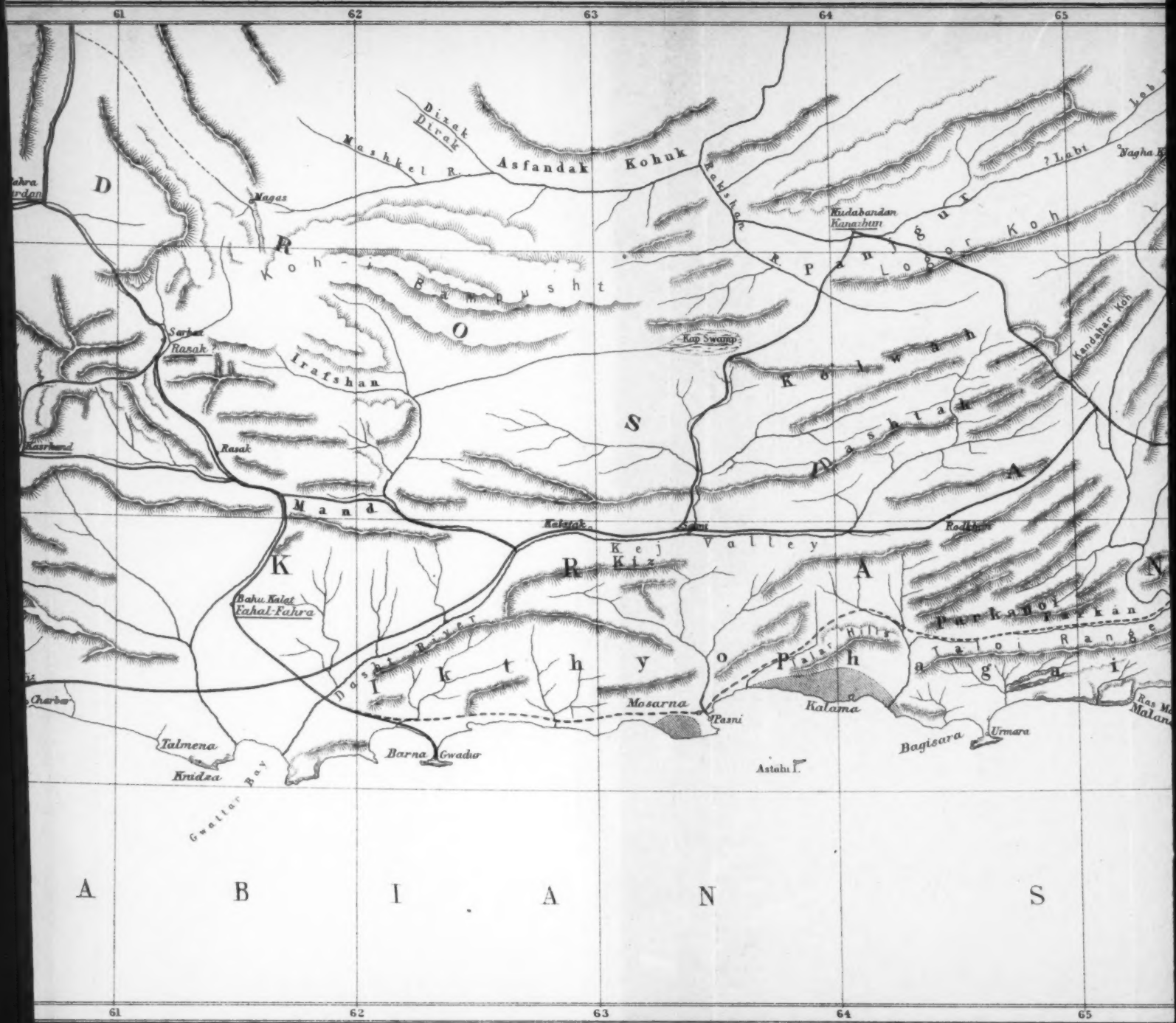
61
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Dizak
Dirak
Mashkel R.
Asfandak
Kohuk
Nagas
Kudabandan
Kanazhun
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Koh-i-Bampusht
Sarbaz
Rasak
Irafshan
Kap Swamp
Kolwah
Dashtak
Kandahar Koh
Kasrkand
Rasak
Mand
Kalatak
Kej Valley
Kiz
Baku Kalat
Fahal-Fahra
Dasht River
Dikthy
Mosarna
Pasni
Kalama
Parkano Tarkan
Talo Range
Bagisara
Urmara
Astalu I.
Talmena
Barna
Gwadur
Kridza
Gwatter Bay
ABIANS
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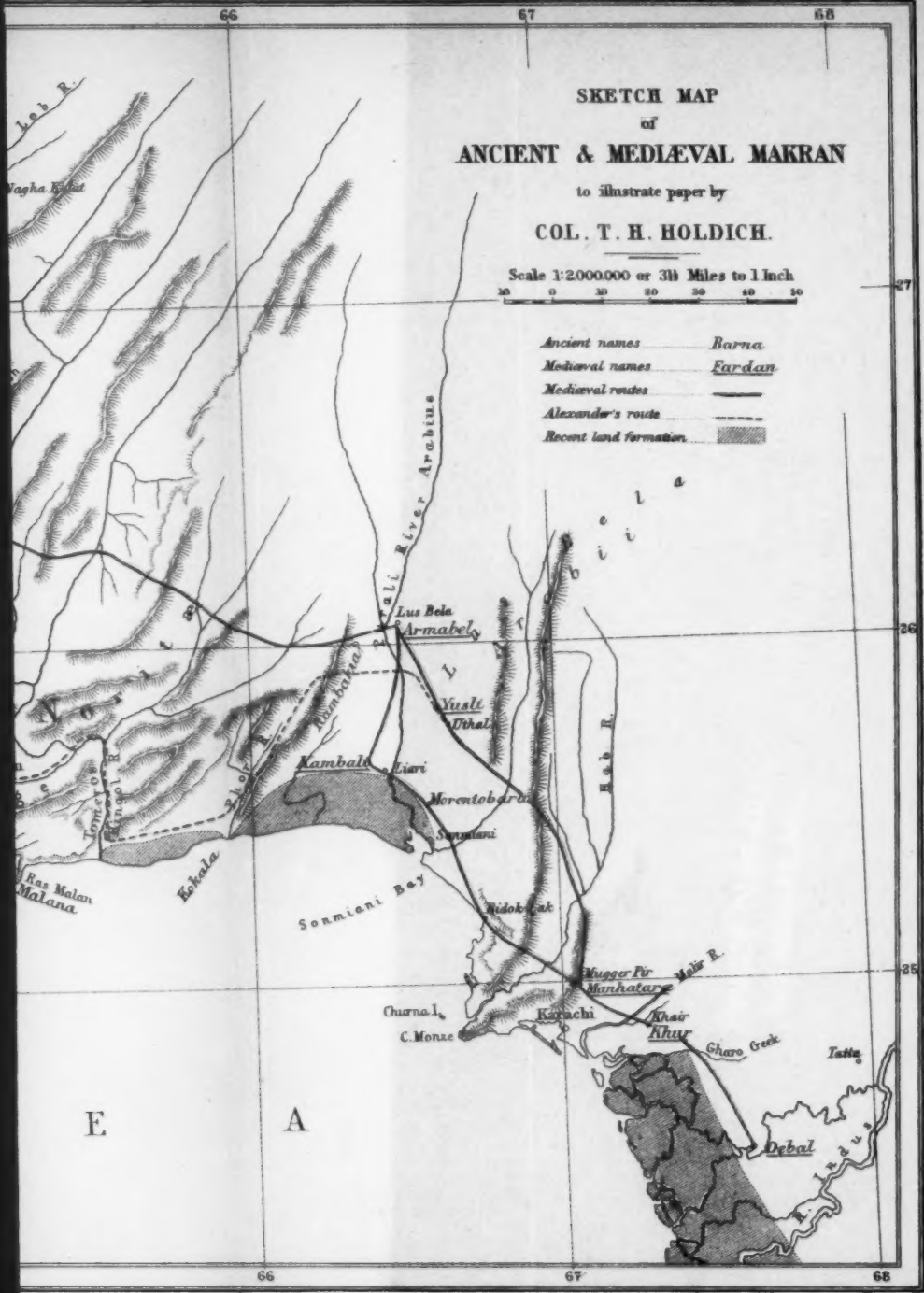
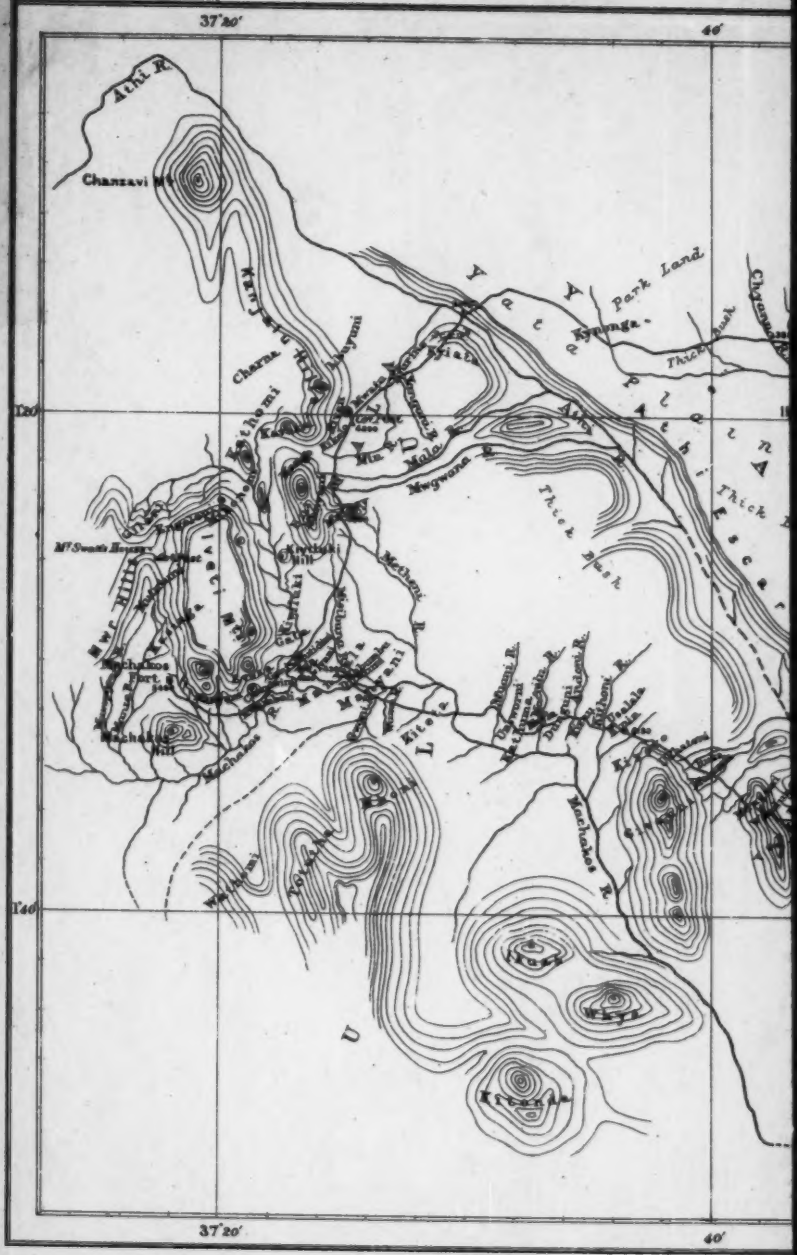
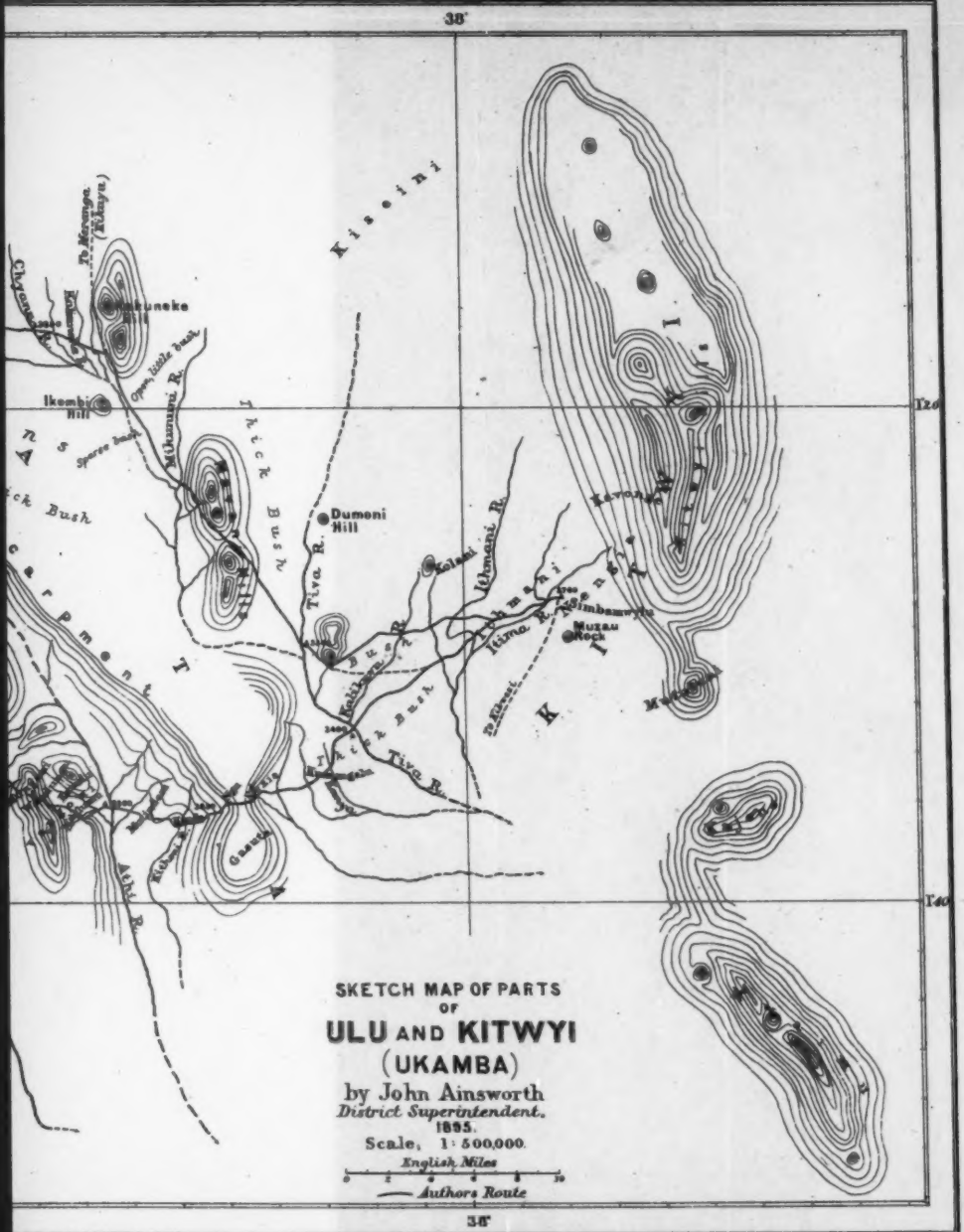

SKETCH MAP
of
ANCIENT & MEDIÆVAL MAKRAN
to illustrate paper by
COL. T. H. HOLDICH.
Scale 1:2,000,000 or 31½ Miles to 1 Inch
30 0 30 20 30 40 50
Ancient names ... Barna
Mediæval names ... Fardan
Mediæval routes
Alexander's route
Recent land formation
66
67
68
27
26
25
Arabian Sea
Lus Bela
Armabel
Yusli
Dihal
Kambali
Liari
Morentobar
Sonmiani
Sonmiani Bay
Ras Malan
Malana
Kokala
Hab R.
Mugger Pir
Manhatar
Malir R.
Churna I.
C. Monze
Karachi
Khair
Khur
Gharo Creek
Tatta
Debal
Indus
E
A
W. Shawe F.R.G.S., 43 Brewer Street, London, W.


37°20'
40'
Athi R.
Chanzavi Mt.
Kanjoro Hill
Charra Hill
Kyiaka
Kyiaka
Kyiaka



SKETCH MAP OF PARTS
OF
ULU AND KITWYI
(UKAMBA)

by John Ainsworth
District Superintendent.
1895.

Scale, 1:500,000.

English Miles

Authors Route

G. Philip & Son.

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